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Peer Influence and Individual Motivations in Global Small Business Adaptation

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Abstract

This research challenges the macro-centric narrative of crisis management by examining the socially embedded responses of small business owners during the global COVID-19 pandemic. While the literature frequently prioritizes the structural resilience of large firms, this study utilizes a novel conceptual framework to analyze how social networks, collective identities, and normative motivations shaped the adaptation strategies of over 27,000 entrepreneurs across 43 countries. Our analysis reveals that entrepreneurial agencies are deeply tied to interpersonal influence; expectations for future opportunities were significantly molded by peer effects, while the social contagion of nearby business closures exacerbated perceived impediments to growth. Furthermore, the study highlights a critical divergence based on entrepreneurial identity: family and purpose-driven actors—whose logic is rooted in social stability—suffered a more pronounced decline in innovation following income shocks compared to their wealth-driven counterparts. Finally, the study quantifies a significant structural shift in the entrepreneurial pipeline. While the pandemic triggered a 1.5% increase in potential entrepreneurs (reflecting a shift in societal aspirations), it caused a 2.3% contraction in emerging entrepreneurs, signaling a breakdown in the transition from individual intent to formal social organization. These findings suggest that crisis adaptation is not merely a financial calculation, but a complex negotiation of social support systems, peer-group benchmarking, and institutional trust.

Keywords: COVID-19; crisis adaption; family; innovation; purpose; small business entrepreneur; wealth

JEL Classification: D22; L26

1. Introduction

Crises typically force businesses to reassess and adapt their strategies, including diversification, cost-cutting measures, and revising business models (e.g., [1]). Any crisis affecting businesses also impacts employees and communities, leading to job losses, mental health challenges, and social instability. While the COVID-19 pandemic shared characteristics with other crises, such as natural disasters or political instability, in terms of disruption, financial strain, and the need for strategic reassessment, its global reach, prolonged impact, and specific health-related challenges set it apart, leading to unique responses and adaptations by businesses (e.g., [2,3]).

The pandemic instigated a profound shift in consumer behavior, marked by increased online shopping, remote work, and a preference for local and essential goods. Businesses had to adapt rapidly to meet these new demands while simultaneously contending with disrupted global supply chains, raw material shortages, and increased costs. Under this

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pressure, a substantial number of small businesses were forced into temporary or permanent closure due to unsustainable operations without steady income (e.g., [4]). However, other businesses demonstrated significant resilience. They successfully adapted by shifting to online models, enhancing their digital presence through e-commerce and social media, and exploiting collaborative knowledge creation. Furthermore, some businesses performed dramatic operational pivots, such as distilleries producing hand sanitizer or clothing manufacturers making masks (e.g., [5–11]).

This period underscored the vital importance of agility, resilience, and the ability to leverage technology to ensure business continuity and growth (e.g., Otero et al. [12,13]). Unpredictable crises amplify uncertainty and highlight the crucial role of proactive recognition and exploitation of opportunities (e.g., [14–17]), often involving the combination of products, processes, or technology for business exploitation (e.g., [18]). Small business entrepreneurs who embraced digital transformation quickly adapted their business models and met challenges more effectively.

This article provides a critical contribution to the literature on crisis adaptation by shifting the focus toward the socially embedded experiences of small business entrepreneurs. This segment has often been marginalized in favor of studies on large-scale corporate structures facing systemic shocks (e.g., [4,10,19–25]). While existing research highlights the importance of a forward-looking orientation in navigating environmental uncertainty [10,26], a sociological lens suggests that such agency is deeply constrained and enabled by the entrepreneur's position within their social network.

The study further advances the field by deconstructing how collective expectations and normative innovation activities were reshaped during the COVID-19 pandemic. To achieve this, it develops a novel conceptual framework that moves beyond mere economic indicators to integrate the relational and structural forces governing entrepreneurial behavior. This framework synthesizes individual life-course circumstances and income shocks with the socio-psychological impact of peer effects, diverse identity-based motivations, and the overarching influence of macro-social country-level factors.

The empirical analysis utilizes the Global Entrepreneurship Monitor (GEM) Adult Population Survey (APS) 2019 and 2020. The APS 2020, covering the early months of the pandemic through August 2020, provided essential data on the impact on household income, expectations of new business opportunities, impediments to start and grow a business, and government support provided. The heterogeneity in these responses enables the modeling of the most important factors driving negative household income shock, entrepreneurial opportunities, and innovation in products and processes/technology. Furthermore, merging the APS 2019 and 2020 facilitates a comparison of innovation propensity between entrepreneurs under normal circumstances and those facing the global crisis, and allows for quantifying the pandemic's impact on business creation.

Empirical findings show that negative income shocks were primarily driven by personal circumstances but also by country-level income. Expectations of new business opportunities in turn were significantly influenced by peer effects and entrepreneurial motivations, while impediments to starting or growing a business were affected by a negative income shock and awareness of others closing businesses, though timely government support was an effective countermeasure. The pandemic was found to have a more severe negative impact on the innovative activities of family and purpose-driven entrepreneurs compared to wealth and purpose-driven entrepreneurs, and slightly discouraged product innovation but had no impact on process/technology innovation. Lastly, business creation was discouraged in the short term but encouraged in the more distant future, though this effect was less pronounced in countries with strict government measures.

This article is organized as follows. Section 2 states the research questions. Section 3 describes the data, presents some descriptive statistics, and refers to methodological aspects. Section 4 presents and discusses the empirical findings. Section 5 closes by presenting the main findings, offering policy recommendations, discussing the study limitations and avenues for future research.

2. Conceptual Framework

2.1. Crisis Adaptation

Successful crisis adaptation often requires a combination of proactive planning, swift decision-making, and the ability to remain flexible and innovative in the face of uncertainty (e.g., [10,12,18,27]). From a personal perspective, emotional and psychological coping, social support and networking, budgeting and debt management, adaptability and flexibility are essential aspects of managing and overcoming personal challenges in times of crisis (e.g., [28]). In this sense, an essential element for positive adaptation is family resilience. As family members are interconnected and inter-dependent, stressors that affect one member have knock-on effects on the others. Specifically, family resilience describes the experience of recovery and growth of families following adversity, through shared beliefs, organizational patterns, and communication [21,27,29].

From a business viewpoint, key aspects of crisis adaptation include: (i) financial management, maintaining liquidity; cutting non-essential costs; accessing financial aid, such as government aid, grants, or loans. (ii) Business model pivoting: expanding product or service lines; adopting online sales channels, digital marketing, and remote work technologies. (iii) Customer relationship management: keeping customers informed about changes in operations and services; implementing programs to retain existing customers. (iv) Operational flexibility: finding alternative suppliers or changing supply chain logistics to mitigate disruptions; adjusting workforce levels, roles, and responsibilities. (v) Innovation and creativity: developing products or services that meet new demands arising from the crisis; quickly adapting to changing circumstances and customer needs. And (vi) community and network support: leveraging local business networks and chambers of commerce for support and resources; partnering with other businesses to share resources, ideas, and support (e.g., [3,7,12,30]).

Examples of crisis adaptation include economic recessions, natural disasters, and the COVID-19 pandemic (e.g., [4,10,16–18,26,31–33]). Specifically, during economic recessions, businesses often cut costs, renegotiate leases, and seek new revenue streams through opportunity recognition and innovation. Individuals in turn may take on additional part-time work, cut discretionary spending, and seek financial advice. Meanwhile, in disaster-prone areas, entrepreneurs usually develop contingency plans, invest in insurance, and build resilient supply chains. Individuals in turn often evacuate to safe locations, seek disaster relief, and rebuild their homes and lives with community and government support. During the COVID-19 pandemic, many businesses pivoted to online sales, implemented health and safety measures, and accessed government relief funds. In turn, people generally adopted social distancing, remote work, online education, increased health precautions, and relied on government support when needed (e.g., [10,11,26]).

2.2. Research Questions

While the COVID-19 pandemic had a widespread negative impact on household incomes, the degree of impact varied significantly based on personal circumstances, including employment status, industry, government support, personal financial situation, household characteristics, geographic location, health impact, and education and skills

(e.g., [28,34–38]). The following research questions aim at looking into these matters by focusing on employed and self-employed individuals.

2.2.1. Peer Effects

The first research question is whether the negative income shock experienced by most households during the time of COVID-19 depended largely on their particular circumstances and those of their acquaintances. For example, was knowledge of others leaving their businesses associated with the likelihood that a household would experience a negative income shock? Did those employed experience a lower probability of a negative income shock than those involved in entrepreneurial activities? (e.g., [22,39]):

RQ_1: *Did the negative impact of COVID-19 on household income depend mostly on personal circumstances?*

The second research question has to do with potential new business opportunities generated by COVID-19. As mentioned in the Introduction, the COVID-19 pandemic significantly affected various aspects of life and businesses, leading to the emergence of new opportunities in multiple sectors, such as e-commerce and online retail, telehealth and remote healthcare services, online education and educational technology, among others (e.g., [25]). The focus of interest in this case is whether knowing other people who started a business was the driving force behind such good business expectations (e.g., [40]):

RQ_2: *Did expectations of new business opportunities due to COVID-19 depend on peer effects mostly?*

2.2.2. Personal Context

The third research question asks whether the difficulties faced in entrepreneurial activities depended mainly on factors such as financial constraints, target market, risk aversion, age and gender, rather than on the degree of effectiveness of government policies in avoiding massive loss of jobs and businesses. In this sense, government support was typically temporary and short-term, and the degree of policy targeting varied across sectors and businesses (e.g., [41]):

RQ_3: *Did the impediments to starting or growing a business due to COVID-19 depend on personal circumstances or business characteristics mostly?*

2.2.3. Innovation and Entrepreneurial Motivations

The fourth research question refers to the importance of entrepreneurial motivations for innovation under financial stress. The latter can heighten the motivation to solve specific problems, especially those that are exacerbated by the financial strain itself. This can lead to innovative solutions and new business ideas. Moreover, financial stress can build resilience, as entrepreneurs learn to navigate challenges and persist despite setbacks. This can foster a determined and persistent mindset (e.g., [42,43]). For example, in such circumstances, would people driven by family tradition and the desire to make a difference in the world behave differently from those who see the accumulation of wealth as a complement or a means to contribute to society through novel products or services?

RQ_4: *Did a negative income shock impact innovation differently depending on entrepreneurial motivations?*

2.2.4. Pre-Pandemic and Pandemic Periods

The final research questions exploit the variability in entrepreneurial endeavors and innovation propensity caused by the COVID-19 pandemic by looking at entrepreneurs interviewed in 2019 and 2020. After accounting for various personal and business char-

acteristics, the focus of interest is whether COVID-19 significantly interfered with or encouraged business creation and product and process/technology innovation among small business entrepreneurs.

As stated in the Introduction, the pandemic accelerated the adoption of digital technologies as, with physical stores closing, many businesses shifted to online platforms, leading to advancements in e-commerce, logistics, and digital payment systems. However, the financial instability caused by the pandemic led to budget cuts and reduced investment in research and development for some companies. Many businesses, especially small and medium-sized ones, faced significant financial strain, limiting their ability to invest in innovative projects (e.g., [4,19,30,44]). In fact, small businesses were more likely to close permanently during the early stages of the pandemic than large businesses [4]:

RQ_5: *When looking at pre- and post-COVID-19 outbreak periods, did entrepreneurs differ in their innovation propensity?*

Likewise, the pandemic caused significant disruptions in many industries, leading to job losses and economic uncertainty. Therefore, many individuals turned to entrepreneurship to generate income and create new opportunities for themselves. The question is whether the percentage of people who considered starting a business or taking part in its creation increased significantly in 2020 compared to 2019. In this sense, the previous literature presents mixed evidence about entrepreneurial initiatives during economic crisis. For example, [17] concluded that entrepreneurship decreased in Spain during the recession period of 2007–2010. This decline was largely explained by a worse perception of business opportunities. This is consistent with the evidence of [45], which suggests that economic difficulties reduce early-stage entrepreneurship but can encourage opportunity-driven entrepreneurship. In turn, [31]'s evidence on the Great Recession in the United States showed that the positive influence of weak labor markets outweighed the negative influence of companies' lower potential income and wealth; thus, leading to greater business creation. More recently, evidence from Denmark presented by [46] shows that start-up subsidies to the unemployed can make entrepreneurship countercyclical. However, in the absence of the subsidy, entrepreneurship tends to be pro-cyclical, as [17,45] suggest:

RQ_6: *When looking at pre- and post-COVID-19 outbreak periods, did the rates of potential and nascent entrepreneurs differ?*

2.3. Synthesis of Research Questions

Figure 1 provides a depiction of these six research questions. Specifically, the core of the figure suggests that the pandemic's impact was mediated by personal and household circumstances. These factors influenced the likelihood of experiencing income shocks, which in turn affected perceptions of opportunity and difficulty. However, these perceptions do not exist in a vacuum; they are embedded social processes where individual action is constrained and enabled by social ties (e.g., [1]). Beyond personal traits, factors such as the successful and unsuccessful experiences of other entrepreneurs (peer effects) highlight how entrepreneurial cognition is socially situated (e.g., [47]).

According to [3], the digital transformation accelerated by the pandemic acted as a catalyst for new business models, but its success was contingent on how entrepreneurs navigated their social and institutional ecosystems. This underscores that adaptation is an embedded process where digital adoption and strategic pivoting are shaped by the entrepreneur's position within a wider network of stakeholders.

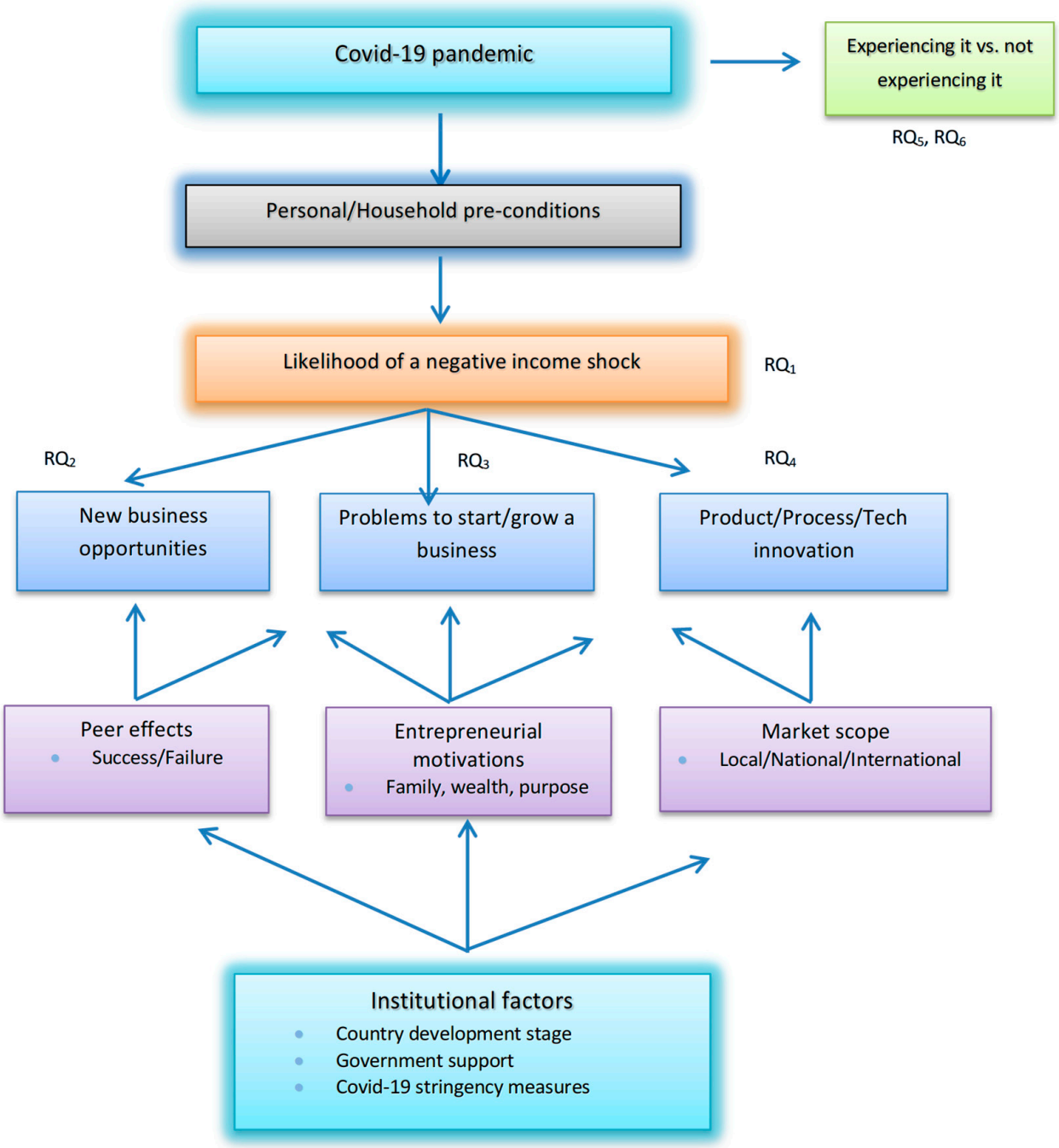


Figure 1. Conceptual framework. Note: This figure provides a conceptual framework for the research questions of this study. RQ_1: Did the negative impact of COVID-19 on household income depend mostly on personal circumstances? RQ_2: Did expectations of new business opportunities due to COVID-19 depend on peer effects mostly? RQ_3: Did impediments to start or grow a business due to COVID-19 depend on personal circumstances or business characteristics mostly? RQ_4: Did a negative income shock impact innovation differently depending on entrepreneurial motivations? RQ_5: When looking at pre- and post-COVID-19 outbreak periods, did entrepreneurs differ in their innovation propensity? RQ_6: When looking at pre- and post-COVID-19 outbreak periods, did the rates of potential and nascent entrepreneurs differ?

Country-level factors, such as development stage, government support, and COVID-19 stringency measures, further shaped these perceptions. Specifically, stringency measures led to unprecedented global restrictions on fundamental freedoms. These measures curtailed movement and assembly while eroding privacy rights via the rapid deployment of

digital surveillance and contact-tracing tools (e.g., [48,49]). In this context, the embeddedness of the entrepreneur refers to their navigation of these shifting rules of the game. The institutional environment [50] provides the formal framework, but the social processes—how entrepreneurs collectively interpret and react to these restrictions—determine the resilience of the entrepreneurial ecosystem.

These aspects constitute RQ_1–RQ_4. In turn, the rectangle in the right upper corner of the figure refers to groups of people who were subject to the pandemic (year 2020) and those who were not (year 2019). These two groups are the focus of RQ_5 and RQ_6, which seek to identify the causal impact of the pandemic on innovation and business creation.

The comprehensive nature of these questions allows for a rich theoretical grounding:

- Effectuation theory emphasizes bird-in-hand principle (starting with available resources), affordable loss (controlling downside risk rather than maximizing upside), and lemonade (leveraging unexpected contingencies)—e.g., [51]. In the uncertainty of COVID-19, entrepreneurs moved away from predictive planning toward effectual logic. Here, available resources were not just physical assets but were socially embedded, including the trust and reciprocity found in immediate networks (e.g., [52]).
- Contingency theory suggests there is no single best way to organize; the optimal approach depends on internal and external factors (e.g., [53]). This aligns with the idea that adaptation is a fit between the business and its changing social environment (e.g., [54]). For micro-businesses, this fit often required a strategic response that balanced internal resource constraints with the external realities of lockdowns and shifting consumer behavior (e.g., [3]).
- Social capital theory directly addresses peer effects (e.g., [5]). Social capital—i.e., information, influence, and support gained from networks—is the engine of embedded social processes (e.g., [55]). During a crisis, bridging social capital (i.e., links to diverse external groups) is vital for opportunity recognition, while bonding social capital (i.e., tight-knit internal circles) is essential for rapid resource mobilization and psychological survival (e.g., [55,56]). These embedded ties allow entrepreneurs to interpret peer experiences and income shocks not as isolated incidents, but as collective challenges requiring collaborative innovation.

In summary, the ability to identify and implement business model innovation during crises is not merely a matter of individual grit, but a result of how entrepreneurs leverage embedded relationships to sense and seize new market realities (e.g., [3]). This process is governed by various dimensions of proximity—social, cognitive, organizational, and institutional—that enable the exchange of tacit knowledge during periods of high volatility (e.g., [57]).

Specifically, cognitive proximity allows entrepreneurs to speak the same language as their peers, facilitating the rapid absorption of new digital strategies, while social proximity, built on trust and kinship, reduces the transaction costs of collaborating under duress. However, as [57] cautions, successful adaptation also requires a degree of distanced perspective to avoid the cognitive lock-in that prevents radical pivoting.

Consequently, adaptation is not an isolated individual response to a shock; it is a collective navigation through the social and digital structures of the new normal. It is the strategic balancing of these proximities that allows an entrepreneurial ecosystem to remain resilient, turning a systemic shock into a catalyst for collaborative evolution (e.g., [58]).

3. Resources and Methods

3.1. Data

This study is based on the GEM Adult Population Survey (APS) 2019–2020, https://www.gemconsortium.org/data/sets?id=aps (accessed on 24 July 2024). GEM is a net-

worked consortium of national country teams associated with leading academic institutions, which collects data on entrepreneurship directly from individual entrepreneurs. The GEM consortium has been actively and consistently measuring and evaluating levels of business activity since 1999. During that time, more than 120 economies have participated in the research [59].

The APS is a comprehensive questionnaire, administered to a minimum of 2000 adults, between 18 and 64 years old, in each GEM country, designed to collect detailed information on respondents' business activity, attitudes, and aspirations. In particular, the APS defines three types of entrepreneurs: nascent, new, and established. Nascent entrepreneurs are those who have taken steps to start a new business but have not yet paid salaries or wages for more than three months. New entrepreneurs in turn are those running a business that has been in operation for between 3 and 42 months (3.5 years), while established entrepreneurs are those who have been in business for more than 3.5 years. Table A1 of the Appendix A reports the study variables and their definitions.

Table A2 in turn provides details of the countries surveyed by year and their corresponding number of observations. Specifically, 50 countries were surveyed in 2019 and 43 in 2020, while 35 countries were surveyed in both years. The merger of the two APS is made up of 58 different countries for a total of 304,409 observations. The analysis first focuses on the APS 2020 by studying how levels of business activity and innovation varied around the world during the early months of the COVID-19 pandemic. (The survey covered until August 2020). The analysis then moves to the merged surveys to quantify the causal impact of the pandemic on business creation and innovation.

3.2. Descriptive Statistics

Sample sizes by geographic region for 2019–2020 are provided in Table 1a. As shown, individuals from Europe were predominant, representing around 48% of the sample. Tables 1b and 1c, respectively, show the percentages of early-stage and established entrepreneurs by geographic region. Early-stage entrepreneurs are composed of nascent and new entrepreneurs. As shown, the Total early-stage Entrepreneurial Activity (TEA) rate was highest in Latin America and Caribbean (25.5%) and the Middle East and Africa (15%). In total, 12% of survey participants undertook TEA during 2019–2020. In turn, established businessmen represented around 8% of the sample. They seemed slightly more prevalent in Central and Eastern Asia (9.4%) and North America (9.2%) during 2019–2020. When comparing 2019 and 2020, one can see that the percentages of early-stage and established entrepreneurs were similar (see Table A3).

Table 1. Descriptive statistics: GEM APS 2019 and 2020. (**a**) Sample size by geographic region: 2019–2020. (**b**) Individuals involved in Total early-stage Entrepreneurial Activity (TEA): 2019–2020. (**c**) Established entrepreneurs: 2019–2020. (**d**) Business size 2019–2020: number of employees and owners. (**e**) Government effectively responded to the economic consequences of COVID-19 pandemic. (**f**) Household income strongly/somewhat decreased due to COVID-19.

(**a**)		
Region	**Frequency**	**Percent**
Middle East & Africa	60,858	19.99
Central & East Asia	31,755	10.43
Latin America & Caribbean	47,835	15.71
Europe	146,747	48.21
North America	17,214	5.65
Total	304,409	100

Table 1. *Cont.*

(**b**)			
Region	**No**	**Yes**	**Total**
Middle East & Africa	51,720	9138	60,858
%	84.98	15.02	100
Central & East Asia	28,326	3429	31,755
%	89.2	10.8	100
Latin America & Caribbean	35,641	12,194	47,835
%	74.51	25.49	100
Europe	136,861	9886	146,747
%	93.26	6.74	100
North America	14,807	2407	17,214
%	86.02	13.98	100
Total	267,355	37,054	304,409
%	87.83	12.17	100
p-value of Pearson chi-squared test of independence = 0.000			

(**c**)			
Region	**No**	**Yes**	**Total**
Middle East & Africa	56,440	4418	60,858
%	92.74	7.26	100
Central & East Asia	28,781	2974	31,755
%	90.63	9.37	100
Latin America & Caribbean	43,578	4257	47,835
%	91.1	8.9	100
Europe	135,751	10,996	135,751
%	92.51	7.49	92.51
North America	15,632	1582	15,632
%	90.81	9.19	90.81
Total	280,182	24,227	304,409
%	92.04	7.96	100
p-value of Pearson chi-squared test of independence = 0.000			

(**d**)					
Nº Employees	**Freq.**	**Percent**	**Nº Owners**	**Freq.**	**Percent**
0–5	31,439	81.50	1	38,056	63.67
6–19	4818	12.49	2–3	17,193	28.77
20+	2319	6.01	>3	4521	7.56
Total	38,576	100	Total	59,770	100

(**e**)			
	Entrepreneur's Answer		
Region	**No**	**Yes**	**Total**
Middle East & Africa	3170	3298	6468
%	49.01	50.99	100

Table 1. *Cont.*

(**e**)			
	Entrepreneur's Answer		
Region	**No**	**Yes**	**Total**
Central & East Asia	1245	1009	2254
%	55.24	44.76	100
Latin America & Caribbean	3858	2104	5962
%	64.71	35.29	100
Europe & North America	5578	3795	9373
&	59.51	40.49	100
Total	13,851	10,206	24,057
%	57.58	42.42	100
p-value of Pearson chi-squared test of independence = 0.000 Note: Answers to this question are those from new and established entrepreneurs included in the APS 2020.			
(**f**)			
Region	**No**	**Yes**	**Total**
Middle East & Africa	10,458	20,108	30,566
%	34.21	65.79	100
Central & East Asia	3747	8159	11,906
%	31.47	68.53	100
Latin America & Caribbean	6185	13,932	20,117
%	30.75	69.25	100
Europe & North America	45,868	30,151	76,019
&	60.34	39.66	100
Total	66,258	72,350	138,608
%	47.8	52.2	100
p-value of Pearson chi-squared test of independence = 0.000 Note: Answers to this question are those from individuals included in the APS 2020.			

In terms of size, businesses were mostly small, measured by either the number of employees or the number of owners. Indeed, Table 1d shows that around 82% of businesses surveyed during 2019–2020 had between 0 and 5 employees, while only 6% had 20 or more employees. Regarding owners, about 64% were single-owned businesses while about 29% of the businesses had 2 or 3 owners.

Table 1e,f in turn, report the responses to COVID-19-related questions covered by the APS 2020. Specifically, Table 1e reports the responses of around 24,000 new and established entrepreneurs to the question about whether the government effectively responded to the economic consequences of the COVID-19 pandemic. As shown, about 58% of the entrepreneurs surveyed answered negatively. When looking at specific geographic regions, this percentage increased to approximately 60% and 65% in Europe and North America, and Latin America and Caribbean, respectively. In turn, Table 1f shows the responses of about 138,000 people to the question about whether their household income decreased considerably or somewhat due to COVID-19. As can be seen, globally about 52% answered affirmatively. This figure reached around 69% among individuals from Latin America and Caribbean, and Central and Eastern Asia, which far exceeded that among individuals from Europe and North America, 39.7%.

3.3. Methodological Aspects

Since for most statistical specifications, the dependent variable is dichotomous, logistic regression analysis will be an essential tool. Other techniques used are propensity score matching (PSM) and regression adjustment (RA), which are methods to estimate causal effects in observational studies where random assignment to treatment and control groups is not feasible (e.g., [60–63]).

Specifically, the propensity score is the probability of a unit (e.g., an entrepreneur) being assigned to a particular treatment given a set of observed covariates. It is typically estimated through a logistic regression model. Once the propensity scores are estimated, units in the treatment group are matched with units in the control group that have similar propensity scores. This creates pairs or sets of treated and control units that are similar in terms of the observed covariates, thereby mimicking randomization. At a later stage, outcomes between the matched treated and control groups are compared to estimate the average treatment effect (ATE). RA in turn fits separate regressions (e.g., linear or logistic) for each treatment level and uses averages of the predicted outcomes over all the data to estimate the potential outcomes means. The estimated ATEs are the difference of the latter.

In the analysis that follows, PSM is used when the treatment is not completely exogenous but depends on personal/business characteristics. RA in turn is used when the treatment is truly exogenous from a personal/business perspective, and a given statistical model (e.g., logistic) is fitted to the treatment and control groups. This empirical strategy is followed for consistency with the statistical models proposed throughout the discussion. However, if there is overlap in covariates, PSM and RA should give similar results when all confounders are observed and included in the model [64].

All statistical methods are implemented in Stata 19.

4. Results and Discussion

This section is divided into three subsections. The first of them (Section 4.1) focuses on questions covered by the APS 2020 on how the COVID-19 pandemic affected people and entrepreneurs in terms of their income and prospects to start and grow a business (RQ_1–RQ_3). This section also analyzes whether an income shock affected innovation propensity differently depending on entrepreneurial motivations (RQ_4). The second Subsection (Section 4.2) is an extension of the previous analysis, which merges the APS 2019 and 2020 so that the sample is made up of entrepreneurs facing a crisis and others operating in normal times. In essence, after controlling for various individual/business characteristics, this methodological strategy would allow identifying the causal impact of COVID-19 on the propensity for business innovation (RQ_5) and business creation (RQ_6). Finally, the third subsection connects the empirical findings with the conceptual framework of Section 2.3.

4.1. COVID-19 Times: Perils and Opportunities

4.1.1. Impact on Household Income

Table 2 reports a logistic regression for the likelihood of a considerable/mild decrease in household income modeled on personal characteristics—gender, age, tertiary education, household income bracket, household size, employment status, entrepreneurial endeavors, knowing people who left their businesses; country-level factors: COVID-19 cases per million, COVID-19 stringency measures, and income group; and, geographic region effects. The sample under consideration is made up of individuals who were not necessarily business owners/managers.

Table 2. Strong/mild household income decrease due to COVID-19: APS 2020.

	Decrease Odds Ratio
Individual-level predictors	
Male	0.957 ***
	(0.014)
35–54 years old	1.037 **
	(0.017)
Over 54 years old	0.666 ***
	(0.013)
Tertiary education	0.891 ***
	(0.014)
Entrepreneurial activity	1.695 ***
	(0.029)
Employed	0.741 ***
	(0.011)
Middle 33%tile income	0.790 ***
	(0.014)
Upper 33%tile income	0.542 ***
	(0.010)
Large-sized household	1.426 ***
	(0.021)
Know people who stopped due to COVID-19	1.826 ***
	(0.029)
Country-level predictors	
Log(COVID-19 confirmed cases/million)	1.037 ***
	(0.008)
COVID-19 stringency Index (≤median)	0.927 ***
	(0.019)
Middle-income country	0.507 ***
	(0.021)
High-income country	0.335 ***
	(0.012)
Central & East Asia	1.086 **
	(0.036)
Latin America & Caribbean	1.383 ***
	(0.036)
Europe &North America	0.659 ***
	(0.015)
Observations	98,313
Pseudo R^2	0.118

*** $p < 0.01$, ** $p < 0.05$. Notes: (1) Robust standard errors in parenthesis. (2) The baseline age category is less than 35 years. (3) The baseline household income group is lowest 33%tile. (4) The baseline region is Middle East & Africa. (5) The baseline country income level is low.

As shown in the table, seniors were less likely to experience a negative income shock than the baseline of people under 35 years old (e.g., [34]). Indeed, the odds for the former were 33% lower than those for the latter. Tertiary education, employment, and household income level also contributed to lower odds (0.89, 0.74, and 0.54 (upper 33-percentile), respectively). By contrast, being involved in entrepreneurial activities and knowing at least two people who had stopped owning and managing a business due to COVID-19 considerably increased the odds of experiencing a negative income shock. Indeed, knowing people who had failed as entrepreneurs is one of the most significant factors, as it increased the odds of a negative income shock by 83%. This can be considered as an approximation of the difficulties experienced by economic activities most familiar to the survey participants.

An income shock was also more likely among large-sized households (odds of 1.43). In contrast, gender had little impact, as the odds of an income decrease for men were only 4% lower than those for women.

It is worth noting that a one-percent increase in the number of confirmed COVID-19 cases per million observed in each country increased the odds of a negative household income shock by only 3.7%. In this regard, Figure 2 shows that there was not a clear association between the percentage of people in each country who experienced a strong/mild negative household income shock and the confirmed COVID-19 cases per million at the national level. For example, by the end of August 2020, Qatar reported almost 44,000 confirmed cases per million, the highest figure in the sample, while the percentage of Qataris reporting a strong/mild negative impact on their household income was approximately 52. This figure was considerably lower than that reported by India (88%), which recorded only about 2500 confirmed cases per million by the end of August 2020. In this sense, COVID-19 stringency measures seemed to have had greater explanatory power, with respect to an income shock, than confirmed cases per million. Indeed, the odds of a negative household income shock were about 7% lower for people in countries with a stringency index less than or equal to the sample median, as of the end of August 2020.

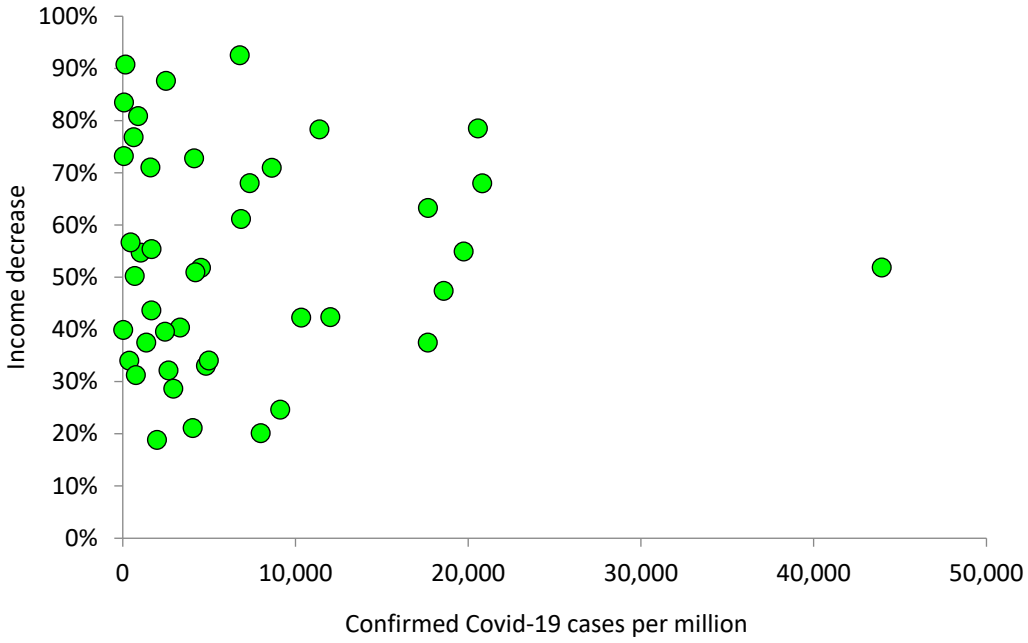


Figure 2. Household income decrease versus confirmed COVID-19 cases per million. Note: On the vertical axis, income decrease indicates the percentage of individuals in a country that experienced a strong/mild household negative income shock. This is computed from the APS 2020 *cphhinc* question. On the horizontal axis, country-level confirmed COVID-19 cases per million, computed as a 7-day rolling average, as of 31 August 2020, are taken from Our World in Data.

It is also worth noting that the odds of a negative household income shock were considerably lower in middle- and high-income countries (52% and 68%, respectively) than in the baseline of low-income countries. This is likely to be a combination of a higher stock of household savings/wealth, more significant government support to counteract the fallout from the pandemic, and stronger institutions in general (e.g., [65,66]).

In summary, this evidence shows that personal circumstances, such as being involved in entrepreneurial activities and knowing other entrepreneurs who had abandoned their businesses, had a considerable impact on an income drop. However, a country's income level was also important to counteract this effect. Therefore, RQ_1 is partially supported.

4.1.2. Perceptions of Business Opportunities

As analyzed in the Introduction and in Section 2.1, the pandemic led many entrepreneurs to adapt to new market circumstances. Table 3 reports a logistic regression for perceptions of new/established entrepreneurs about new opportunities provided by COVID-19. In this case, the focus of interest is on whether peer effects had a strong effect on such perceptions (RQ_2). Peer effects are approximated by the APS 2020 question: "Do you know at least two persons who have started a business in 2020 as a result of the corona virus pandemic?" Several controls are included in the regression, such as gender, age, tertiary education, risk aversion, self-efficacy, personal network, entrepreneurial motivations, and government effectiveness in managing COVID-19 (e.g., [40,67]).

Table 3. COVID-19 provided new opportunities: APS 2020.

	New Opportunities Odds Ratio
Individual-level predictors	
Know people who started due to COVID-19	2.073 ***
	(0.081)
Male	0.985
	(0.033)
35–54 years old	0.815 ***
	(0.029)
Over 54 years old	0.546 ***
	(0.028)
Tertiary education	1.248 ***
	(0.044)
Risk aversion	0.942 *
	(0.032)
Self-efficacy	1.211 ***
	(0.066)
Strong/Mild income decrease	0.633 ***
	(0.023)
Government response to COVID-19	1.767 ***
	(0.059)
Personal network	1.182 ***
	(0.042)
Motivation: Family tradition	1.181 ***
	(0.041)
Motivation: Wealth accumulation	1.309 ***
	(0.046)
Motivation: Earn a living	1.045
	(0.040)
Motivation: Make a difference	2.156 ***
	(0.073)
Country-level predictors	
Middle-income country	1.148 *
	(0.082)
High-income country	1.306 ***
	(0.083)
Central & East Asia	0.998
	(0.070)
Latin America & Caribbean	1.732 ***
	(0.100)
Europe &North America	0.927
	(0.052)
Observations	20,026
Pseudo R^2	0.124

*** $p < 0.01$, * $p < 0.1$. Notes: (1) Robust standard errors in parenthesis. (2) The baseline age category is less than 35 years. (3) The baseline region is Middle East & Africa. (4) The baseline country income level is low.

Regarding entrepreneurial motivations, starting 2019 the APS includes four different motivations: (i) to make a difference in the world, (ii) to build great wealth or a very high income, (iii) to continue a family tradition; and (iv) to earn a living because jobs are scarce. Previous versions of the APS distinguished between opportunity and necessity as primary motivations for entrepreneurial activity. However, it has been recognized that this dichotomy may not fully reflect the nuances of motivations for founding new businesses [68].

As noted by [68], reasons for being in business are important because they illustrate the general socioeconomic conditions in which individuals operate. Additionally, entrepreneurial motivations impact new hires, the reach of the customer base (e.g., local, national, or international), the percentage of revenue expected from international sales, the novelty of products or services, and technology and processes used. It is important to highlight that these motivations are the ones respondents stated for starting a business in the past. In this sense, feedback between the innovation process, for example, and previously stated motivations can be ruled out.

As shown in Table 3, the odds of foreseeing new business opportunities were strongly and positively impacted by knowing other people who undertook entrepreneurial activities (odds of 2.1). However, the entrepreneurial motivation of making a difference in the world had an equally strong impact (odds of 2.2). These business perceptions were also positively affected by COVID-19 government support (odds of 1.8) and were more prevalent in certain geographic regions, such as Latin America and Caribbean (odds of 1.7). In contrast, business perceptions were negatively impacted by having experienced a strong/mild negative income shock (odds of 0.63) and senior age (odds of 0.55). Interestingly, there is no indication that gender influenced perceptions. In other words, RQ_2 is partially supported.

4.1.3. Obstacles to Start and Grow a Business

Despite the potential business opportunities brought about by COVID-19, to many the pandemic represented an impediment to business endeavors due to logistic and financial issues (e.g., [2,25,44]). In this respect, Table 4a reports logistic models for the likelihood of finding difficult to start and grow a business due to COVID-19. As shown, a strong/mild income shock considerably increased negative perceptions of starting (odds of 1.9) and, particularly, of growing a business (odds of 3.1). Knowing other people who had stopped their business activities also contributed to negative perceptions of starting and growing (odds of 1.6 and 1.4, respectively). Similarly for risk aversion and senior age (odds of 1.4 and 1.3, respectively). By contrast, negative perceptions were attenuated by government response to COVID-19, national/international market scope, having personal networks, and being motivated by wealth accumulation. Hence, this evidence lends support to RQ_3.

As a robustness check, the above evidence is complemented by Table 4b, which reports the ATEs of being in a country with relatively low government stringency measures against COVID-19. This treatment can be considered exogenous from an individual's perspective. As shown in panel (i), the ATE is –12.4 percentage points for starting a business, which is very statistically significant. That is, less rigid COVID-19 containment measures translated into fewer perceived obstacles to get started. Interestingly, panel (ii) shows that lower stringency did not necessarily translate into fewer perceived obstacles to growing a business. Indeed, the ATE is slightly positive (2.6 percentage points) and statistically significant at the 5% level, although not at the 1% level. It is possible that even in areas with relaxed restrictions reduced consumer spending, supply chain disruptions, and increased uncertainty may have continued to hinder business growth.

Table 4. COVID-19 made business start and grow difficult: APS 2020.

(a) Logistic Regressions		
	(1) Start Odds Ratio	**(2) Growth Odds Ratio**
Individual-level predictors		
Male	0.853 ***	0.920 ***
	(0.028)	(0.029)
35–54 years old	1.184 ***	1.270 ***
	(0.043)	(0.045)
Over 54 years old	1.277 ***	1.398 ***
	(0.063)	(0.066)
Risk aversion	1.371 ***	1.286 ***
	(0.048)	(0.043)
Self-efficacy	0.734 ***	0.959
	(0.040)	(0.049)
Personal network	0.786 ***	0.825 ***
	(0.027)	(0.028)
Tertiary education	0.933 **	1.014
	(0.033)	(0.035)
Strong/Mild income decrease	1.929 ***	3.103 ***
	(0.067)	(0.108)
Know people who stopped due to COVID-19	0.662 ***	0.809 ***
	(0.022)	(0.026)
Motivation: Family tradition	1.586 ***	1.431 ***
	(0.054)	(0.047)
Motivation: Wealth accumulation	1.042	0.791 ***
	(0.036)	(0.027)
Motivation: Earn a living	0.877 ***	0.888 ***
	(0.031)	(0.030)
Motivation: Make a difference	1.014	0.994
	(0.036)	(0.033)
Market scope: National	1.181 ***	1.204 ***
	(0.044)	(0.044)
Market scope: International	0.896 ***	0.901 ***
	(0.032)	(0.031)
Government response to COVID-19	0.868 ***	0.840 ***
	(0.041)	(0.039)
Country-level predictors		
Middle-income country	0.896	1.334 ***
	(0.064)	(0.091)
High-income country	0.909	1.703 ***
	(0.060)	(0.107)
Central & East Asia	1.294 ***	1.533 ***
	(0.094)	(0.110)
Latin America & Caribbean	1.041	0.553 ***
	(0.059)	(0.031)
Europe & North America	0.619 ***	0.678 ***
	(0.034)	(0.037)

Table 4. *Cont.*

(a) Logistic Regressions		
	(1) Start Odds Ratio	**(2) Growth Odds Ratio**
Observations	19,204	19,255
Pseudo R^2	0.069	0.081

*** $p < 0.01$, ** $p < 0.05$. Notes: (1) Robust standard errors in parenthesis. (2) The baseline market scope is regional. (3) The baseline region is Middle East & Africa. (4) The baseline country income level is low.

(b) Impact of COVID-19 Stringency on Starting and Growing a Business: Regression Adjustment.

(i) Difficulty starting a business: all entrepreneurs					**N = 19,204**	
Average treatment effect	Coefficient	Robust s.e	z	$p > \|z\|$	95% conf. interval	
Stringency ≤ median (Yes vs. No)	−0.124	0.010	−12.97	0.000	−0.142	−0.105
Potential outcome Stringency > median	0.724	0.004	165.21	0.000	0.716	0.733
(ii) Difficulty growing a business: all entrepreneurs					**N = 19,255**	
Average treatment effect	Coefficient	Robust s.e	z	$p > \|z\|$	95% conf. interval	
Stringency ≤ median (Yes vs. No)	0.026	0.011	2.44	0.015	0.005	0.048
Potential outcome Stringency > median	0.559	0.005	120.00	0.000	0.550	0.568

Note: Estimates are average treatment effects obtained through regression adjustment (RA). The treatment is being located in a country with a COVID-19 stringency index value below sample median. RA follows a two-step approach: 1. Fitting separate regression models of the outcome (i.e., difficulty to start a business) on a set of covariates for each treatment level (i.e., below or above median COVID-19 stringency). 2. Computing the averages of the predicted outcomes for each individual (i.e., entrepreneur) and treatment level. The ATE is the difference between the potential outcome means. Explanatory variables for the regressions models are the same as those of Table 4a.

4.1.4. Profitability and Innovation

The APS does not record any measure of business profitability. However, previous research has used household income as an approximation (e.g., [69,70]). A matter of interest is how a negative shock on this profitability proxy impacts innovation, and how entrepreneurial motivations matter to innovation decisions. As mentioned earlier, the entrepreneurial motivations considered by the APS are: (i) to make a difference, (ii) to build great wealth, (iii) to continue a family tradition; and (iv) to earn a living. The analysis of this section focuses on motivations (i), (ii), and (iii), which can be associated with altruistic ends, ambition for wealth, and family capital, respectively. In particular, sample statistics show that entrepreneurs motivated by making a difference were more innovative in products or processes/technology than the average entrepreneur (34%/32% compared with 24%/23%).

For completeness, Table A4 presents estimation results for entrepreneurs driven by economic necessity, but who are not interested in making a difference at the same time. As shown in the table, for this subgroup, a negative income shock did not substantially impact their innovative initiatives. Sample statistics show that this subgroup exhibited a

propensity to innovate in products or processes/technology of about 16%, compared to about 23% in the full sample.

Panels (a) and (b) of Table 5, respectively, report propensity score matching estimates to quantify the impact of a negative income shock on product and process/technology innovation (RQ_4). Here, the treatment is experiencing a negative income shock, which is modeled on the covariates of Table 2 and on business characteristics. As stated in Section 3.3, once the propensity scores are estimated, individuals in the treatment group are matched with individuals in the control group that have similar propensity scores.

Table 5. Impact of a negative income shock on product and process/technology innovation: APS 2020. (**a**) Product innovation. (**b**) Process/technology innovation.

(**a**)						
(i) All entrepreneurs					**N = 19,630**	
Average treatment effect	Coefficient	Robust s.e	z	$p > \|z\|$	95% conf. interval	
Negative income shock (Yes vs. No)	−0.036	0.009	−4.17	0.000	−0.053	−0.019
(ii) Entrepreneurs driven by family tradition and making a difference					**N = 3726**	
Average treatment effect	Coefficient	Robust s.e	z	$p > \|z\|$	95% conf. interval	
Negative income shock (Yes vs. No)	−0.063	0.022	−2.86	0.004	−0.107	−0.020
(iii) Entrepreneurs driven by wealth accumulation and making a difference					**N = 5664**	
Average treatment effect	Coefficient	Robust s.e	z	$p > \|z\|$	95% conf. interval	
Above-median family rate (Yes vs. No)	−0.042	0.018	−2.31	0.021	−0.078	−0.006
(**b**)						
(i) All entrepreneurs					**N = 19,588**	
Average treatment effect	Coefficient	Robust s.e	z	$p > \|z\|$	95% conf. interval	
Negative income shock (Yes vs. No)	−0.020	0.009	−2.36	0.018	−0.037	−0.003
(ii) Entrepreneurs driven by family tradition and making a difference					**N = 3716**	
Average treatment effect	Coefficient	Robust s.e	z	$p > \|z\|$	95% conf. interval	
Negative income shock (Yes vs. No)	−0.049	0.022	−2.19	0.028	−0.093	−0.005
(iii) Entrepreneurs driven by wealth accumulation and making a difference					**N = 5645**	
Average treatment effect	Coefficient	Robust s.e	z	$p > \|z\|$	95% conf. interval	
Above-median family rate (Yes vs. No)	−0.037	0.017	−2.16	0.030	−0.070	−0.003

Note: Estimates are average treatment effects obtained through propensity score matching with a logistic treatment model. The treatment is experiencing a strong/mild negative income shock. The explanatory variables of the treatment model are gender, age, household income, household size, knowing people who left their businesses due to COVID-19, early-stage entrepreneur (TEA), economic sector, market scope, log(COVID-19 confirmed cases/million), stringency index (≤median), country income group, and geographic region.

As shown in panel (a)-(i), a negative income shock decreased the likelihood of product innovation of all entrepreneurs by −3.6%. When focusing on specific entrepreneurial motivations, panels (a)-(ii) and (a)-(iii) suggest that a negative income shock hit harder product innovation of entrepreneurs driven by family tradition and making a difference than that of entrepreneurs driven by wealth accumulation and making a difference (−6.3% versus −4.2%). Regarding process/technology innovation of all entrepreneurs, panel (b)–(i) shows that the impact of a negative income shock was slightly smaller (−2.0%) than the one reported for product innovation. In turn, the likelihood of process/technology innovation for entrepreneurs motivated by family tradition and making a difference or by wealth and making a difference fell by 4.9% and 3.7%, respectively.

Altogether, this evidence suggests that entrepreneurial motivations may have had an impact on innovation in the presence of a non-negligible decrease in business profitability. And those entrepreneurs who, along with seeking to make a difference, wished to keep family capital were more strongly affected. This finding can be associated with the peculiarities of family businesses. Indeed, family businesses tend to be risk-averse compared to non-family businesses, prioritizing stability and long-term survival over rapid changes (e.g., [21,71,72]). Moreover, decision-making in family businesses often involves multiple family members, which can complicate and slow down the process (e.g., [73]). During the pandemic, it is likely that the need for quick and decisive actions could have been hindered by these dynamics. Nevertheless, recent literature has shown that during crises, risk-averse family firms may productively engage into risk-taking and innovative behavior (e.g., [74,75]).

Therefore, RQ_4 is supported.

4.2. Extensions: Entrepreneurs Interviewed in 2019 and 2020

4.2.1. Innovation Rates

So far, the analysis has concentrated on COVID-19 related questions recorded by the APS 2020. This section looks at innovation activities of entrepreneurs surveyed in 2019 and 2020. After accounting for personal and business characteristics, the fundamental difference between the two groups is that one experienced the COVID-19 pandemic. Table 6 reports logistic regressions for product and process/technology innovation. Both regressions account for several factors, such as gender, self-efficacy, age, household income, business growth opportunities, age of the business approximated by TEA, number of business owners as an approximation of business size, market scope, and sector, among other factors (e.g., [70]).

As shown in column (1) of Table 6, COVID-19 had a mild negative impact on product innovation. Indeed, the odds of innovating in products were about 8% lower for those entrepreneurs experiencing the COVID-19. Moreover, as column (2) shows, the pandemic did not seem to have affected process/technology innovation. Thus, at least in most small businesses, the early months of the pandemic did not accelerate innovation (e.g., [2,44,76]). In contrast, international market scope seemed to have been one of the most relevant factors to innovation (e.g., [77,78]) during 2019 and 2020.

As a robustness check, Table 7 complements this evidence by using the statistical technique of regression adjustment. Here the treatment is experiencing the COVID-19 pandemic, which can be considered exogenous. Consistent with Table 6, panels (a) and (b) of Table 7 suggest that COVID-19 only affected product innovation, by decreasing its likelihood by 1.6%. Furthermore, Panel (a) of Table 7 shows that the rate of product innovation among entrepreneurs sampled in 2019 reached 26.3%. Therefore, the innovation propensity among those sampled in 2020 was about 24.6% (=26.2 − 1.6). This implies that the odds of product innovation for these entrepreneurs were about 93.9% (=24.6/26.2) of those who did not experience COVID-19. This figure is relatively close to that reported in column (1) of Table 6, 91.5%.

The remaining panels of Table 7 for the subsamples, which are classified by entrepreneurial motivations, do not exhibit statistical differences. One aspect to highlight is that the innovation rate, either in products or process/technology, was higher among entrepreneurs driven by either family and making a difference or wealth and making a difference (about 33–35%) than that for the entire sample. It is likely that the desire to contribute to society played a role here (e.g., [43,79,80]).

Table 6. Impact of COVID-19 on product and technology/process innovation: APS 2019–2020.

	(1) Product Odds Ratio	(2) Process/Tech Odds Ratio
Individual-level predictors		
COVID-19	0.915 ***	0.963
	(0.023)	(0.024)
Male	1.045 *	1.169 ***
	(0.027)	(0.031)
Self-efficacy	1.244 ***	1.183 ***
	(0.050)	(0.047)
Under 35 years old	1.208 ***	1.171 ***
	(0.032)	(0.032)
Upper 33%tile income	1.027	1.058 **
	(0.026)	(0.027)
Growth business	1.736 ***	2.061 ***
	(0.062)	(0.073)
Early-stage entrepreneur (TEA)	1.739 ***	1.488 ***
	(0.051)	(0.043)
≥3 business owners	1.279 ***	1.346 ***
	(0.059)	(0.062)
Market scope: National	1.421 ***	1.476 ***
	(0.041)	(0.043)
Market scope: International	2.265 ***	2.217 ***
	(0.080)	(0.080)
Sector: Transforming	1.729 ***	1.323 ***
	(0.111)	(0.080)
Sector: Business service	1.820 ***	1.537 ***
	(0.120)	(0.096)
Sector: Consumer oriented	1.954 ***	1.370 ***
	(0.120)	(0.080)
Country-level predictors		
R&D transfer	1.074 ***	1.007
	(0.025)	(0.024)
Middle-income country	0.963	1.072
	(0.058)	(0.067)
High-income country	1.289 ***	1.584 ***
	(0.074)	(0.097)
Regional fixed effects	Yes	Yes
Observations	36,850	36,754
Pseudo R^2	0.059	0.063

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Notes: (1) Robust standard errors in parenthesis. (2) COVID-19 is a binary variable that equals 1 if a survey respondent belongs to the APS 2020. (3) The baseline household income group is the lowest 33%tile. (4) The baseline market scope is regional. (5) The baseline sector is extractive. (6) The baseline country income level is low.

Table 7. Impact of COVID-19 on product and process/tech innovation: APS 2019–2020.

(a) Product innovation: all entrepreneurs					**N = 36,850**	
Average treatment effect	Coefficient	Robust s.e	z	$p > \|z\|$	95% conf.	interval
COVID-19 (Yes vs. No)	−0.016	0.004	−3.59	0.000	−0.027	−0.007
Potential outcome						
No COVID-19	0.262	0.003	84.48	0.000	0.256	0.268
(b) Process/technology innovation: all entrepreneurs					**N = 36,754**	
Average treatment effect	Coefficient	Robust s.e	z	$p > \|z\|$	95% conf.	interval
COVID-19 (Yes vs. No)	−0.007	0.004	−1.50	0.134	−0.015	0.002
Potential outcome						
No COVID-19	0.254	0.003	82.58	0.000	0.248	0.260
(c) Product innovation: entrepreneurs driven by family and making a difference					**N = 7690**	
Average treatment effect	Coefficient	Robust s.e	z	$p > \|z\|$	95% conf.	interval
COVID-19 (Yes vs. No)	−0.008	0.011	−0.72	0.474	−0.030	0.014
Potential outcome						
No COVID-19	0.331	0.001	46.05	0.000	0.317	0.345
(d) Product innovation: entrepreneurs driven by wealth and making a difference					**N = 10,822**	
Average treatment effect	Coefficient	Robust s.e	z	$p > \|z\|$	95% conf.	interval
COVID-19 (Yes vs. No)	−0.008	0.009	−0.83	0.408	−0.026	0.010
Potential outcome						
No COVID-19	0.345	0.006	54.78	0.000	0.333	0.358
(e) Process/tech innovation: entrepreneurs driven by family and making a difference					**N = 7669**	
Average treatment effect	Coefficient	Robust s.e	z	$p > \|z\|$	95% conf.	interval
COVID-19 (Yes vs. No)	0.002	0.011	0.17	0.865	−0.020	0.023
Potential outcome						
No COVID-19	0.338	0.007	46.61	0.000	0.324	0.352
(f) Process/tech innovation: entrepreneurs driven by wealth and making a difference					**N = 10,793**	
Average treatment effect	Coefficient	Robust s.e	z	$p > \|z\|$	95% conf.	interval
COVID-19 (Yes vs. No)	−0.002	0.009	−0.18	0.855	−0.020	0.016
Potential outcome						
No COVID-19	0.353	0.006	55.68	0.000	0.340	0.365

Note: Estimates are average treatment effects obtained through regression adjustment (RA). The treatment is experiencing the COVID-19 pandemic. The explanatory variables of the innovation equation are gender, age, self-efficacy, household income, early-stage entrepreneur (TEA), growth business, number of owners, economic sector, market scope, R&D transfer, country income group, and geographic region. RA follows a two-step approach: 1. Fitting separate regression models of the outcome (i.e., innovate) on a set of covariates for each treatment level (i.e., COVID-19 and No COVID-19). 2. Computing the averages of the predicted outcomes for each individual (i.e., entrepreneur) and treatment level. The ATE is the difference between the potential outcome means.

4.2.2. Entrepreneurial Initiatives

Table 8 presents logistic regressions for the probability of being a potential or nascent entrepreneur. As shown, COVID-19 increased the odds of becoming a potential entrepreneur by 9.8%, while it decreased the odds of becoming a nascent entrepreneur by 17%. It should be noted that potential entrepreneurs are those who plan to set up a business within three years in the future. Therefore, their investment horizon is the medium-term. On the contrary, nascent entrepreneurs are those who are already trying to start a business. Consequently, it appears that the pandemic discouraged short-term business decisions but encouraged those to be made in the more distant future. Hence, from this perspective, the first-order effect is that business creation was pro-cyclical during the early months of the pandemic (e.g., [45]).

Table 8. Impact of COVID-19 in future entrepreneurial activity: APS 2019–2020.

	(1) Potential Entrepreneur Odds Ratio	(2) Nascent Entrepreneur Odds Ratio
Individual-level predictors		
COVID-19	1.098 ***	0.830 ***
	(0.014)	(0.012)
35–54 years old	0.680 ***	0.863 ***
	(0.009)	(0.013)
Over 54 years old	0.365 ***	0.531 ***
	(0.007)	(0.012)
Male	1.231 ***	1.211 ***
	(0.016)	(0.017)
Self-efficacy	2.523 ***	3.404 ***
	(0.038)	(0.065)
Risk aversion	0.826 ***	0.762 ***
	(0.011)	(0.011)
Opportunity alertness	1.374 ***	1.385 ***
	(0.018)	(0.020)
Personal network	1.814 ***	1.942 ***
	(0.024)	(0.028)
Employed	0.980	0.733 ***
	(0.013)	(0.011)
Tertiary education	1.174 ***	1.119 ***
	(0.017)	(0.017)
Middle 33%tile income	0.962 **	1.045 **
	(0.015)	(0.018)
Upper 33%tile income	0.934 ***	1.008
	(0.015)	(0.018)
Country-level predictors		
Middle-income country	0.545 ***	0.583 ***
	(0.014)	(0.016)
High-income country	0.651 ***	0.672 ***
	(0.015)	(0.016)
Asia & Oceania	0.593 ***	0.723 ***
	(0.014)	(0.018)
Latin America & Caribbean	1.450 ***	1.361 ***
	(0.028)	(0.028)
Europe	0.267 ***	0.337 ***
	(0.005)	(0.007)
North America	0.429 ***	0.844 ***
	(0.013)	(0.027)
Observations	159,769	165,448
Pseudo R^2	0.186	0.161

*** $p < 0.01$, ** $p < 0.05$. Notes: (1) Robust standard errors in parenthesis. (2) COVID-19 is a binary variable that equals 1 if a survey respondent belongs to the APS 2020. (3) The baseline age category is less than 35 years. (4) The baseline household income group is the lowest 33%tile. (5) The baseline region is Africa. This follows the regional classification of the APS 2019. (6) The baseline country income level is low.

A robustness check based on regression adjustment analysis shows that this is the case. Specifically, Panel (a)–(i) of Table 9 suggests that COVID-19 increased the likelihood of becoming a potential entrepreneur by 1.5% in the full sample of 58 countries. Panel (a)–(i) also shows that the rate of potential entrepreneurs among individuals sampled in 2019 reached 27.2%. Therefore, the corresponding rate in 2020 was approximately 28.7% (=27.2 + 1.5). This in turn implies that the odds of becoming a potential entrepreneur

in 2020 were 5.5% higher (=28.7/27.2) than in 2019. This figure is slightly lower than that reported in column (1) of Table 8, 9.8%.

Table 9. Impact of COVID-19 in future entrepreneurial activity (regression adjustment): APS 2019–2020. (**a**) Full sample. (**b**) Countries with highest values of COVID-19 stringency index: Chile, Colombia, and Guatemala.

			(**a**)			
(i) Considering starting a business					**N = 159,769**	
Average treatment effect	Coefficient	Robust s.e	z	$p > \|z\|$	95% conf.	interval
COVID-19 (Yes vs. No)	0.015	0.002	7.42	0.000	0.011	0.019
Potential outcome						
No COVID-19	0.272	0.001	185.92	0.000	0.269	0.275
(ii) Starting a business					**N = 165,448**	
Average treatment effect	Coefficient	Robust s.e	z	$p > \|z\|$	95% conf.	interval
COVID-19 (Yes vs. No)	−0.023	0.002	−12.90	0.000	−0.027	−0.020
Potential outcome						
No COVID-19	0.195	0.001	150.47	0.000	0.193	0.198
			(**b**)			
(i) Considering starting a business					**N = 20,484**	
Average treatment effect	Coefficient	Robust s.e	z	$p > \|z\|$	95% conf.	interval
COVID-19 (Yes vs. No)	0.003	0.007	0.47	0.641	−0.010	0.016
Potential outcome						
No COVID-19	0.499	0.005	97.08	0.000	0.489	0.509
(ii) Starting a business					**N = 20,766**	
Average treatment effect	Coefficient	Robust s.e	z	$p > \|z\|$	95% conf.	interval
COVID-19 (Yes vs. No)	−0.060	0.006	−9.64	0.000	−0.072	−0.048
Potential outcome						
No COVID-19	0.350	0.005	72.62	0.000	0.341	0.359

Notes: (1) The full sample is made up of the 58 countries listed in Table A2. (2) The restricted sample is made up of the three countries with the highest values of the COVID-19 stringency index, as of August 2020: Chile (87.5), Colombia (87.04), and Guatemala (87.04). (3) Estimates are average treatment effects obtained through regression adjustment (RA). The treatment is experiencing the COVID-19 pandemic. The explanatory variables of each equation are age, gender, self-efficacy, risk aversion, opportunity alertness, personal network, being employed, tertiary education, household income, country income group, and geographic region. RA follows a two-step approach: 1. Fitting separate regression models of the outcome (i.e., potential entrepreneur) on a set of covariates for each treatment level (i.e., COVID-19 and No COVID-19). 2. Computing the averages of the predicted outcomes for each individual and treatment level. The ATE is the difference between the potential outcome means.

Panel (a)-(ii) shows, in turn, that COVID-19 increased the likelihood of being a nascent entrepreneur by 2.3%. Likewise, the rate of nascent entrepreneurs in 2019 reached 19.5%. Therefore, the corresponding rate in 2020 was around 17.2% (=19.5 − 2.3). This implies that the odds of being a nascent entrepreneur in 2020 were approximately 12% lower (=17.2/19.5) than in 2019. Once again, this figure is slightly different from that reported in Table 8, 17%. Nevertheless, regression adjustment is a more flexible methodology for computing treatment effects because separate regression models are fit to treatment and control groups.

It is also relevant to quantify the extent to which very strict government measures against COVID-19 hampered business initiatives. To address this matter, the sample is restricted to the three countries that exhibited the highest values of the COVID-19 stringency index as of August 2020: Chile (87.50), Colombia (87.04), and Guatemala (87.04). As shown in panel (b)-(i) of Table 9, COVID-19 did not have an impact on future entrepreneurial

activity compared to 2019. However, the likelihood of starting a business decreased by 6% compared to 2019. In other words, severe containment measures further discouraged entrepreneurship. It is worth noting that these countries were more entrepreneurial than average in 2019. Indeed, about 50% of people considered starting a business while 35% had started one in 2019.

4.3. Multidimensional Theoretical Analysis of Findings

The article's findings can be effectively interpreted through the lens of effectuation theory, which describes how entrepreneurs act in uncertain environments by focusing on their available means. While foundational logic suggests a reliance on individual resources, recent studies emphasize that in extreme crises, these means are inherently socially embedded; they encompass the temporal resourcing and relational trust found in immediate networks rather than just physical assets (e.g., [81]). The evidence that personal circumstances primarily drove negative income shocks (RQ_1) aligns with this modern effectual view, where the entrepreneur's domestic and social spheres are inseparable from their strategic capacity (e.g., [82]).

The significant role of peer effects in identifying new business opportunities (RQ_2) and the deterrent effect of peers closing businesses (RQ_3) reinforces this. These findings illustrate social capital theory in action (e.g., [5]), where social capital—the resources of information and support gained from networks—serves as the engine for embedded social processes. Entrepreneurs did not just perceive the market; they leveraged their social capital to co-create an uncertain future through collective sense-making. Furthermore, the finding that process/technology innovation was stable while product innovation declined (RQ_5) suggests the use of the affordable loss principle (e.g., [83]). Here, entrepreneurs preserved capital by focusing on less costly, internal improvements—often utilizing embedded knowledge from their networks—rather than risky, market-facing development.

The study's results also strongly support contingency theory, which posits that the optimal entrepreneurial response depends on specific internal and external factors (e.g., [53]). The most notable contingency finding is the differential impact across business types (RQ_4): family and purpose-driven entrepreneurs were more severely affected by income shocks than wealth-driven ones. This demonstrates that the effectiveness of adaptation is contingent upon the business' internal social structure and underlying motivations. Similarly, overcoming market barriers was contingent on external policy; timely government support served as an effective countermeasure to negative expectations (RQ_3), highlighting how the institutional embeddedness of the entrepreneur—i.e., their relationship with state and regulatory bodies—moderates resilience (e.g., [57,84]).

The research further illuminates how entrepreneurs managed strategic flexibility across time horizons. The differential impact on business creation (RQ6) is key: the pandemic discouraged new ventures in the short term but encouraged them in the distant future. This behavior reflects effectuation's strategic flexibility (e.g., [85]), where immediate high-risk commitments are postponed while future opportunities are sought. However, this long-term encouragement was contingent upon environmental constraints, such as strict government measures, supporting the view that external regulations moderate the embedded social processes of opportunity recognition.

In summary, the article shows that entrepreneurs relied on their personal means and peer networks (social capital) to navigate the crisis, while their success was fundamentally contingent upon their firm type, internal motivations, and macro-environmental factors (e.g., [3]). The findings provide empirical evidence for the synergistic operation of effectuation and contingency principles, demonstrating that adaptation is a collective navigation through the social and digital structures of a new phase.

5. Conclusions

Overall, while the COVID-19 pandemic brought significant challenges, it also demonstrated the resilience and creativity of small businesses in adapting to unprecedented circumstances. In this sense, the pandemic accelerated trends that were already underway, such as digital transformation and flexible work arrangements (e.g., [2,10,25]).

This article focused on the 2019 and 2020 waves of the GEM APS. On one hand, the APS 2020 made it possible to analyze entrepreneurs' expectations about new business opportunities as well as challenges of setting up and growing a business during COVID-19. On the other hand, the significant decline in household income experienced by some entrepreneurs allowed quantifying the extent to which an income negative shock can hamper product and process/technology innovation. In turn, the merger of the 2019 and 2020 surveys allowed comparing entrepreneurs who did not experience COVID-19 with those who did. In this way, it was possible to isolate the impact of the pandemic on innovation rates and business creation, after controlling for personal and business characteristics.

5.1. Summary of Findings

This article formulated six research questions. The first question asked whether a negative income shock caused by COVID-19 depended mostly on personal circumstances. The evidence showed that this was largely true; however, country-level income also mattered considerably. The second research question asked whether expectations of new business opportunities due to COVID-19 depended on peer effects mostly. The evidence showed that peer effects were of great importance but so were entrepreneurial motivations, such as making a difference in society. The third research question looked into the impact of personal circumstances and business characteristics on impediments to start or grow a business during the pandemic. The evidence showed that a negative income shock and knowing other people who had left their businesses had a great impact on these impediments. However, timely government support was an effective way to counteract negative expectations.

Research question four and five focused on the impact of the pandemic on product and process/technology innovation. Specifically, research question four looked at how a negative income shock impacted innovative activities of family and purpose-driven entrepreneurs as compared with those of wealth and purpose-driven entrepreneurs. The evidence showed that the former were more severely affected, probably due to the idiosyncrasies of family businesses. In turn, research question five asked whether entrepreneurs differed in their innovation propensity when looking at pre- and post-COVID-19 outbreak periods. The evidence showed that product innovation was slightly discouraged by the pandemic, but no impact was found for process/technology innovation.

Finally, research question 6 focused on the impact of the pandemic on business creation. The evidence showed that the pandemic discouraged starting a business in the short term but encouraged it in the more distant future. In other words, for some individuals the pandemic opened future business prospects (e.g., [86]). However, this was less evident in countries subject to strict government measures to combat COVID-19.

5.2. Policy Recommendations

5.2.1. Targeted Financial Support and Income Protection

Given that a severe or mild income decrease negatively impacts innovative activities, particularly for family and purpose-driven entrepreneurs, policy must prioritize targeted financial interventions. This includes implementing specific subsidies or targeted financial support to ensure income stability for these vulnerable groups, thereby helping them maintain their capacity for innovation during economic downturns. Concurrently, establishing reliable income protection mechanisms, such as unemployment benefits or income

supplements specifically for small business owners, is essential to buffer against severe income shocks and sustain entrepreneurial activities (e.g., [87]).

5.2.2. Enhancing Resilience Through Diversification and Preparedness

Public policy should actively encourage businesses to diversify their revenue streams to reduce the risk exposure associated with severe income shocks. Supporting diversification strategies through mechanisms like grants for exploring new markets or assistance for developing new products can significantly enhance overall business resilience (e.g., [9]). Furthermore, providing accessible training and resources on crisis preparedness and management is crucial for equipping entrepreneurs to better navigate and adapt to future economic disruptions while maintaining their ability to innovate.

5.2.3. Fostering Digital Adoption and Addressing Short-Term Creation Dips

The evidence indicated that the initial phase of the pandemic slightly harmed product innovation but did not significantly change the adoption of new processes or technologies. This suggests the crisis primarily accelerated the adoption and intensified the use of existing digital resources, such as e-commerce, digital marketing, and online platforms (e.g., [13]). Policy should, therefore, focus on facilitating and maximizing access to and training for these existing technologies. Furthermore, the finding that business creation was pro-cyclical (decreasing) in the short term, especially in countries with very strict containment measures, validates existing evidence that entrepreneurship tends to decrease in periods of crisis (e.g., [17,45]). This short-term dip highlights the need for policies designed to specifically counter immediate market and regulatory friction affecting startup formation during initial crisis stages.

5.2.4. Use of Artificial Intelligence (AI)

The integration of AI within smart city infrastructures offers a transformative pathway to mitigating the adverse effects of future global health crises. As highlighted by [88], AI-driven systems in urban environments can proactively address the negative socio-economic and logistical consequences experienced during the COVID-19 pandemic. By leveraging real-time data analytics and automated monitoring, smart cities can optimize resource allocation, enhance public safety, and maintain essential services without the need for the broad, intrusive restrictions on fundamental freedoms seen in previous years. This technological framework not only bolsters urban resilience but also aligns with long-term sustainability goals by ensuring that pandemic responses are more targeted, efficient, and less disruptive to the fabric of civil society.

5.3. Limitations and Future Research

While this study offers valuable insights, limitations necessitate a nuanced interpretation of the results. First, the reliance on cross-sectional, self-reported data from the 2020 GEM cycle limits the ability to establish definitive causal relationships between income shocks, peer effects, and innovation propensity. Because these variables were captured at a single point in time, we cannot fully account for the lagged effects of social capital or the evolving nature of the pandemic. Furthermore, the data reflects only the initial phase of the COVID-19 crisis; as such, its temporal scope is constrained to the immediate shock, potentially overlooking the long-term embedded social processes that facilitate sustained business model adaptation [82]. Additionally, using self-reported measures for peer influence and entrepreneurial motivation introduces the risk of common-method bias, as perceptions of social networks are inherently subjective (e.g., [89]).

To address these constraints, future research should adopt a mixed-methods approach, integrating large-scale GEM datasets with in-depth qualitative fieldwork [3]. Such

an approach would permit a more granular exploration of the mechanisms by which peer influence operates within professional associations and localized industrial clusters—environments where cognitive and social proximity are most potent [57]. Furthermore, researchers should investigate how cultural context moderates peer influence, as the efficacy of social capital often varies across individualistic and collectivistic societies [12]. Finally, the application of hierarchical linear modeling would allow analyzing how individual behaviors are nested within broader country-level institutional frameworks, providing an alternative perspective of the synergy between effectuation and contingency in a post-pandemic era.

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Appendix A

Table A1. List of variables in alphabetical order.

Variable	Description	Type	Source
Age of entrepreneur	=1 if under 35, =2 if 35–54, =3 if 55+.	Categorical	GEM *age*
Country income	Low, middle, or high.	Categorical	GEM *wbincrev*
COVID-19 cases	COVID-19 cases per million people. 7-day rolling average as of 31 August 2020.	Numerical	https://ourworldindata.org/covid-cases (accessed on 8 January 2026)
COVID-19 stringency	=1 if index value $\leq$ sample median.	Binary	https://ourworldindata.org/covid-stringency-index (accessed on 8 January 2026)
Employed	=1 if has a part- or full-time job.	Binary	GEM *gemoccu*
Entrepreneur	=1 if business owner/manager or trying to start a business.	Binary	GEM *ownmge, bstart*
Entrepreneurial motivation	1: make a difference in the world; 2: build wealth; 3: family tradition; 4: earn a living due to scarce jobs.	Binary	GEM *teayymot1-teayymot4 eb_yymot1-eb_yymot4*
Government response to COVID-19	=1 if somewhat/strongly agrees that government so far has effectively responded to the economic consequences of the coronavirus pandemic.	Binary	GEM *su_cpgovres*, *bb_cpgovres*, *eb_cpgovres*, *teacpgovres*
Growth business	=1 if expects to create 20+ jobs in 5 years.	Binary	GEM *teayyj5y*, *eb_yyj5y*

Table A1. *Cont.*

Variable	Description	Type	Source
Household income	Household income recorded into 3rd.	Categorical	GEM *gemhhinc*
Know people who started	=1 if know 2 or more people who started a business due to COVID-19.	Binary	GEM cpknstart
Know people who stopped	=1 if know 2 or more people who stopped owing/managing a business due to COVID-19.	Binary	GEM cpknstop
Large-sized household	=1 if household size > 75%tile.	Binary	GEM *hhsize*
Market scope	1: local, 2: national, 3: international	Categorical	GEM TEAyyMKSC, EB_MKSC
Nascent entrepreneur	=1 if alone or with others, currently trying to start a new business.	Binary	GEM *bstart*
New opportunities	=1 if somewhat/strongly agrees that coronavirus pandemic provided new opportunities to pursue with business.	Binary	GEM *su_cpnewopp*, *bb_cpnewopp*, *eb_cpnewopp*, *teacpnewopp*
Opportunity alertness	=1 if sees good opportunities for starting a business in the next 6 months.	Binary	GEM *opportyy*
Personal network	=1 if knows at least 2 entrepreneurs.	Binary	GEM *knowentr*
Potential entrepreneur	=1 alone or with others, expecting to start a new business within the next three years.	Binary	GEM *futsup*
Product innovation	=1 if product (service) is new to area, country or world.	Binary	GEM *teanewprod*, *eb_newprod*
Process/Tech innovation	=1 if procedure/technology used is new to area, country or world.	Binary	GEM *teanewproc*, *eb_newproc*
R&D transfer	National R&D leads to new commercial opportunities and is available to SMEs on a Likert scale of 1 (“Completely false”) to 9 (“Completely true”).	Categorical	NES
Risk aversion	=1 if fear of failing.	Binary	GEM *frfailyy*
Sector	(1) Extractive: agriculture, forestry & fishing, mining & quarrying; (2) Transforming: manufacturing, construction, and wholesale trade; (3) Services: professional and business service; (4) Consumer oriented: trading activities to final consumer & personal services.	Categorical	GEM *TEASIC4C/EB_SIC4C*
Self-efficacy	=1 has the knowledge, skill and experience required to start a new business.	Binary	GEM *suskilyy*
Strong/mild income decrease	=1 if somewhat/strong household income decrease due to COVID-19.	Binary	GEM *cphhinc*
Tertiary education	=1 if at least has tertiary education.	Binary	GEM *uneduc*

Table A2. Countries sampled by the GEM APS 2019 and 2020.

No.	Code	Name	Observations			Percent	Region
			2019	2020	Total		
1	1	United States	3000	2000	5000	1.64	North America
2	7	Russia	2006	2000	4006	1.32	Europe
3	20	Egypt	2540	2786	5326	1.75	Middle East & Africa
4	27	South Africa	2991		2991	0.98	Middle East & Africa
5	30	Greece	2000	2000	4000	1.31	Europe
6	31	Netherlands	2252	2266	4518	1.48	Europe
7	34	Spain	23,300	26,075	49,375	16.22	Europe
8	39	Italy	2000	2000	4000	1.31	Europe
9	41	Switzerland	2015	2008	4023	1.32	Europe
10	43	Austria		4529	4529	1.49	Europe
11	44	United Kingdom	2032	2000	4032	1.32	Europe
12	46	Sweden	5067	5043	10,110	3.32	Europe
13	47	Norway	2000	2000	4000	1.31	Europe
14	48	Poland	8000	8000	16,000	5.26	Europe
15	49	Germany	3004	3003	6007	1.97	Europe
16	52	Mexico	5361		5361	1.76	Latin America & Caribbean
17	55	Brazil	2000	2000	4000	1.31	Latin America & Caribbean
18	56	Chile	9110	9196	18,306	6.01	Latin America & Caribbean
19	57	Colombia	2109	2107	4216	1.38	Latin America & Caribbean
20	61	Australia	2000		2000	0.66	Central & East Asia
21	62	Indonesia		2500	2500	0.82	Central & East Asia
22	81	Japan	2027		2027	0.67	Central & East Asia
23	82	South Korea	2000	2000	4000	1.31	Central & East Asia
24	86	China	3841		3841	1.26	Central & East Asia
25	91	India	3398	3317	6715	2.21	Central & East Asia
26	92	Pakistan	2000		2000	0.66	Central & East Asia
27	98	Iran	3122	3144	6266	2.06	Middle East & Africa
28	101	Canada	9304	2910	12,214	4.01	North America
29	212	Morocco	3510	3527	7037	2.31	Middle East & Africa
30	226	Burkina Faso		2325	2325	0.76	Middle East & Africa
31	228	Togo		2248	2248	0.74	Middle East & Africa
32	244	Angola		2000	2000	0.66	Middle East & Africa
33	261	Madagascar	2395		2395	0.79	Middle East & Africa
34	351	Portugal	2013		2013	0.66	Europe
35	352	Luxembourg	2100	2011	4111	1.35	Europe
36	353	Ireland	2000		2000	0.66	Europe
37	357	Cyprus	2014	2006	4020	1.32	Europe
38	371	Latvia	2000	2000	4000	1.31	Europe

Table A2. *Cont.*

No.	Code	Name	Observations 2019	2020	Total	Percent	Region
39	374	Armenia	2000		2000	0.66	Central & East Asia
40	375	Belarus	2001		2001	0.66	Europe
41	385	Croatia	2000	2000	4000	1.31	Europe
42	386	Slovenia	2001	2000	4001	1.31	Europe
43	389	Macedonia	2000		2000	0.66	Europe
44	421	Slovakia	2001	2000	4001	1.31	Europe
45	502	Guatemala	2958	2905	5863	1.93	Latin America & Caribbean
46	507	Panama	2024	2000	4024	1.32	Latin America & Caribbean
47	593	Ecuador	2063		2063	0.68	Latin America & Caribbean
48	598	Uruguay		2002	2002	0.66	Latin America & Caribbean
49	701	Kazakhstan		2100	2100	0.69	Central & East Asia
50	787	Puerto Rico	2000		2000	0.66	Latin America & Caribbean
51	886	Taiwan	2343	2229	4572	1.5	Central & East Asia
52	962	Jordan	2000		2000	0.66	Middle East & Africa
53	965	Kuwait		2092	2092	0.69	Middle East & Africa
54	966	Saudi Arabia	4003	4027	8030	2.64	Middle East & Africa
55	968	Oman	2000	2000	4000	1.31	Middle East & Africa
56	971	United Arab Emirates	2002	2004	4006	1.32	Middle East & Africa
57	972	Israel	2036	2000	4036	1.33	Middle East & Africa
58	974	Qatar	3063	3043	6106	2.01	Middle East & Africa
		Total	163,006	141,403	304,409	100	

Notes: (1) Countries are sorted by country code. (2) Blank spaces in either 2019 or 2020 indicate that a country was not present in that particular survey. (3) Fifty countries were surveyed in 2019 and 43 in 2020, while 35 countries were surveyed in both years.

Table A3. Percentages of early-stage (TEA) and established entrepreneurs in 2019 and 2020.

	TEA			Established		
Year	**No**	**Yes**	**Total**	**No**	**Yes**	**Total**
2019	143,174	19,832	163,006	149,848	13,158	163,006
%	87.83	12.17	100	91.93	8.07	100
2020	124,181	17,222	141,403	130,334	11,069	141,403
%	87.82	12.18	100	92.17	7.83	100
Total	267,355	37,054	304,409	280,182	24,227	304,409
%	87.83	12.17	100	92.04	7.96	100
p-value Pearson χ^2 test of independence = 0.913				p-value Pearson χ^2 test of independence = 0.013		

Table A4. Impact of a negative income shock on product and process/technology innovation: Necessity-driven entrepreneurs.

(a) Product Innovation					**N = 7724**	
Average treatment effect	Coefficient	Robust s.e	z	$p > \|z\|$	95% conf. interval	
Negative income shock (Yes vs. No)	−0.024	0.012	−1.95	0.050	−0.048	0.000
(b) Process/Technology Innovation					**N = 7702**	
Average treatment effect	Coefficient	Robust s.e	z	$p > \|z\|$	95% conf. interval	
Negative income shock (Yes vs. No)	−0.019	0.018	−1.59	0.111	−0.042	0.004

Notes: (1) These are entrepreneurs driven by necessity but not by wishing to make a difference simultaneously. (2) Estimates are average treatment effects obtained through propensity score matching (PSM) with a logistic treatment model. The treatment is experiencing a strong/mild negative income shock. The explanatory variables of the treatment model are gender, age, household income, household size, knowing people who left their businesses due to COVID-19, early-stage entrepreneur (TEA), economic sector, market scope, log(COVID-19 confirmed cases/million), stringency index (≤median), country income group, and geographic region. (3) Data is from the APS 2020.

References

1. Lee, Y.; Kim, J.; Mah, S.; Karr, A. Entrepreneurship in Times of Crisis: A Comprehensive Review with Future Directions. *Entrep. Res. J.* **2024**, *14*, 905–950. [CrossRef]
2. Apedo-Amah, M.C.; Avdiu, B.; Cirera, X.; Cruz, M.; Davies, E.; Grover, A.; Iacovone, L.; Kilinc, U.; Medvedev, D.; Maduko, F.O.; et al. Unmasking the impact of COVID-19 on businesses: Firm level evidence from across the world. In *Policy Research Working Paper Series*; The World Bank: Washington, DC, USA, 2020; p. 9434. Available online: https://www.worldbank.org/en/research/brief/world-bank-policy-research-working-papers (accessed on 1 August 2025).
3. Peñarroya-Farell, M.; Miralles, F. Business model adaptation to the COVID-19 crisis: Strategic response of the Spanish cultural and creative firms. *J. Open Innov. Technol. Mark. Complex.* **2022**, *8*, 39. [CrossRef]
4. Fairlie, R.; Fossen, F.M.; Johnsen, R.; Droboniku, G. Were small businesses more likely to permanently close in the pandemic? *Small Bus. Econ.* **2023**, *60*, 1613–1629. [CrossRef]
5. Al-Omoush, K.S.; Simón-Moya, V.; Sendra-García, J. The impact of social capital and collaborative knowledge creation on e-business proactiveness and organizational agility in responding to the COVID-19 crisis. *J. Innov. Knowl.* **2020**, *5*, 279–288. [CrossRef]
6. Liguori, E.W.; Pittz, T.G. Strategies for small business: Surviving and thriving in the era of COVID-19. *J. Int. Counc. Small Bus.* **2020**, *1*, 106–110. [CrossRef]
7. Al-Omoush, K.S.; Ribeiro-Navarrete, S.; Lassala, C.; Skare, M. Networking and knowledge creation: Social capital and collaborative innovation in responding to the COVID-19 crisis. *J. Innov. Knowl.* **2022**, *7*, 100181. [CrossRef]
8. Engidaw, A.E. Small businesses and their challenges during COVID-19 pandemic in developing countries: In the case of Ethiopia. *J. Innov. Entrep.* **2022**, *11*, 1. [CrossRef]
9. Otrachshenko, V.; Popova, O.; Nikolova, M.; Tyurina, E. COVID-19 and entrepreneurship entry and exit: Opportunity amidst adversity. *Technol. Soc.* **2022**, *71*, 102093. [CrossRef]
10. Chapman Cook, M.; Karau, S.J. Opportunity in uncertainty: Small business response to COVID-19. *Innov. Manag. Rev.* **2023**, *20*, 162–178. [CrossRef]
11. Fernandes Crespo, N.; Fernandes Crespo, C.; Miranda Silva, G.; Bedin Nicola, M. Innovation in times of crisis: The relevance of digitalization and early internationalization strategies. *Technol. Forecast. Soc. Change* **2023**, *188*, 122283. [CrossRef]
12. Otero, G.; Völker, B.; Rözer, J.; Mollenhorst, G. Differences in access to social capital across societies. *Eur. Sociol. Rev.* **2024**, *40*, 493–510. [CrossRef]
13. Jaumotte, F.; Li, L.; Medici, A.; Oikonomou, M.; Pizzinelli, C.; Shibata, I.; Soh, J.; Tavares, M.T. Digitalization during the COVID-19 Crisis: Implications for productivity and labor markets in advanced economies. In *Staff Discussion Note 2023/003*; International Monetary Fund: Washington, DC, USA, 2023. Available online: https://www.imf.org/en/Publications/Staff-Discussion-Notes/ (accessed on 1 August 2025).
14. Hundt, C.; Sternberg, R. How did the economic crisis influence new firm creation? A multilevel approach based upon data from German regions. In *The Great Recession and Its Aftermath: Evidence from Micro-Data: Themenheft 6/Bd. 234(2014) Jahrbücher für Nationalökonomie und Statistik*; Görg, H., Wagner, J., Eds.; De Gruyter Oldenbourg: Berlin, Germany; Boston, MA, USA, 2014; pp. 722–756. [CrossRef]
15. Amabile, T.M.; Pratt, M.G. The dynamic componential model of creativity and innovation in organizations: Making progress, making meaning. *Res. Organ. Behav.* **2016**, *36*, 157–183. [CrossRef]

16. Santos, S.C.; Caetano, A.; Spagnoli, P.; Costa, S.F.; Neumeyer, X. Predictors of entrepreneurial activity before and during the European economic crisis. *Int. Entrep. Manag. J.* **2017**, *13*, 1263–1288. [CrossRef]
17. González-Pernía, J.L.; Guerrero, M.; Jung, A.; Legazkue, P. Economic recession shake-out and entrepreneurship: Evidence from Spain. *BRQ Bus. Res. Q.* **2018**, *21*, 153–167. [CrossRef]
18. Devece, C.; Peris-Ortiz, M.; Rueda-Armengot, C. Entrepreneurship during economic crisis: Success factors and path to failure. *J. Bus. Res.* **2016**, *69*, 5366–5370. [CrossRef]
19. Fairlie, R. The impact of COVID-19 on small business owners: Evidence from the first three months after widespread social-distancing restrictions. *J. Econ. Manag. Strategy* **2020**, *29*, 727–740. [CrossRef] [PubMed]
20. Shafi, M.; Liu, J.; Ren, W. Impact of COVID-19 pandemic on micro, small, and medium-sized Enterprises operating in Pakistan. *Res. Glob.* **2020**, *2*, 100018. [CrossRef]
21. Mahto, R.; Llanos-Contreras, O.; Hebles, M. Post-disaster recovery for family firms: The role of owner motivations, firm resources, and dynamic capabilities. *J. Bus. Res.* **2022**, *145*, 117–129. [CrossRef]
22. Kim, J.; Lee, S. Can stimulus checks to households save the local economy? The impact of South Korea's COVID-19 stimulus on small business sales. *Econ. Anal. Policy* **2024**, *84*, 159–176. [CrossRef]
23. Matikonis, K.; Graham, B. Dynamic capabilities and employment during COVID-19: The moderating effect of government support. *Int. Small Bus. J.* **2024**, *42*, 157–184. [CrossRef]
24. Alshebami, A.S. Crisis management and customer adaptation: Pathways to adaptive capacity and resilience in micro- and small-sized enterprises. *Sustainability* **2025**, *17*, 3759. [CrossRef]
25. Koporcic, N.; Kukkamalla, P.K.; Markovic, S.; Maran, T. Resilience of small and medium-sized enterprises in times of crisis: An umbrella review. *Rev. Manag. Sci.* **2025**, *20*, 301–329. [CrossRef]
26. Fernandez, V. Capital, digitalization, and formality: Chilean micro-enterprises during COVID-19. *Adm. Sci.* **2025**, *15*, 409. [CrossRef]
27. Shoychet, G.; Browne, D.T.; Wade, M.; Prime, H. Assessing positive adaptation during a global crisis: The development and validation of the family positive adaptation during COVID-19 scale. *Front. Psychol.* **2022**, *13*, 886504. [CrossRef] [PubMed]
28. Cardona-Montoya, R.A.; Cruz, V.; Mongrut, S.A. Financial fragility and financial stress during the COVID-19 crisis: Evidence from Colombian households. *J. Econ. Financ. Adm. Sci.* **2022**, *27*, 376–393. [CrossRef]
29. Walsh, F. Family resilience: A dynamic systemic framework. In *Multisystemic Resilience: Adaptation and Transformation in Contexts of Change*; Ungar, M., Ed.; Oxford University Press: Oxford, UK, 2021; pp. 255–270. [CrossRef]
30. Kuckertz, A.; Brändle, L.; Gaudig, A.; Hinderer, S.; Morales Reyes, C.A.; Prochotta, A.; Steinbrick, K.M.; Berger, E.S.C. Startups in times of crisis—A rapid response to the COVID-19 pandemic. *J. Bus. Ventur. Insights* **2020**, *13*, e00169. [CrossRef]
31. Fairlie, R.W. Entrepreneurship, economic conditions, and the Great Recession. *J. Econ. Manag. Strategy* **2013**, *22*, 207–231. [CrossRef]
32. Salvato, C.; Sargiacomo, M.; Amore, M.D.; Minichilli, A. Natural disasters as a source of entrepreneurial opportunity: Family business resilience after an earthquake. *Strateg. Entrep. J.* **2020**, *14*, 594–615. [CrossRef]
33. Harries, T. Understanding small business adaptation to natural hazards: A critical review. *Int. J. Disaster Risk Reduct.* **2021**, *63*, 102403. [CrossRef]
34. Clark, R.L.; Lusardi, A.; Mitchell, O.S. Financial fragility during the COVID-19 pandemic. *AEA Pap. Proc.* **2021**, *111*, 292–296. [CrossRef]
35. Agosto, A.; Giudici, P.; Tanda, A. Statistical learning models to measure the impact of COVID-19 on financial fragility. *Front. Artif. Intell.* **2024**, *7*, 1358812. [CrossRef]
36. Ben Hassen, T.; El Bilali, H. Three years into the pandemic: Insights of the COVID-19 impacts on food security and nutrition in low and middle-income countries. *Heliyon* **2024**, *10*, e28946. [CrossRef] [PubMed]
37. Dang, H.-A.; Huynh, T.L.D.; Nguyen, M.-H. Does the COVID-19 pandemic disproportionately affect the poor? Evidence from a six-country survey. *J. Econ. Dev.* **2024**, *26*, 2–18. [CrossRef]
38. Omotayo, A.O.; Ogunniyi, A.I. COVID-19 induced shocks and its implications for human capital development. *Int. J. Equity Health* **2024**, *23*, 30. [CrossRef]
39. Di Pietro, G. Changes in household income during COVID-19: A longitudinal analysis. *SN Bus. Econ.* **2022**, *2*, 159. [CrossRef] [PubMed]
40. Wyrwich, M.; Sternberg, R.; Stuetzer, M. Failing role models and the formation of fear of entrepreneurial failure: A study of regional peer effects in German regions. *J. Econ. Geogr.* **2019**, *19*, 567–588. [CrossRef]
41. Dornean, A.; Oanea, D. The effectiveness of fiscal-budgetary measures to counteract the COVID-19 crisis. Evidence from EU countries. *Economics* **2022**, *16*, 137–151. [CrossRef]
42. Murnieks, C.Y.; Klotz, A.C.; Shepherd, D.A. Entrepreneurial motivation: A review of the literature and an agenda for future research. *J. Organ. Behav.* **2020**, *41*, 115–143. [CrossRef]

43. Fernandez, V. Purpose-driven entrepreneurship and innovation: The moderating effect of altruism. *Sustain. Futures* **2025**, *10*, 100838. [CrossRef]
44. Bartik, A.W.; Bertrand, M.; Cullen, Z.; Glaeser, E.L.; Luca, M. The impact of COVID-19 on small business outcomes and expectations. *Proc. Natl. Acad. Sci. USA* **2020**, *117*, 17656–17666. [CrossRef]
45. Núñez, Y.M.; Morales-Alonso, G. Longitudinal study of necessity- and opportunity-based entrepreneurship upon COVID lockdowns—The importance of misery and economic freedom indexes. *Technol. Forecast. Soc. Change* **2024**, *200*, 123079. [CrossRef]
46. Marino, M.; Melillo, F.; Parrotta, P.; Smith, N. What makes entrepreneurship counter-cyclical? Evidence from a shutdown of start-up subsidies in Denmark. *Entrep. Reg. Dev.* **2024**, *36*, 1232–1256. [CrossRef]
47. Bosma, N.; Hessels, J.; Schutjens, V.; Van Praag, M.; Verheul, I. Entrepreneurship and role models. *J. Econ. Psychol.* **2012**, *33*, 410–424. [CrossRef]
48. Gostin, L.; Friedman, E.A.; Hossain, S.; Mukherjee, J.; Zia-Zarifi, S.; Clinton, C.; Rugege, U.; Buss, P.; Were, M.; Dhai, A. Human rights and the COVID-19 pandemic: A retrospective and prospective analysis. *Lancet* **2023**, *401*, 154–168. [CrossRef] [PubMed]
49. Jance, K.; Reci, M. Restrictions on human rights during the COVID-19 pandemic in the Western Balkans. *Jurid. Trib. Rev. Comp. Int. Law* **2024**, *14*, 465–480. [CrossRef]
50. North, D.C. *Institutions, Institutional Change and Economic Performance*; Cambridge University Press: Cambridge, UK, 1990.
51. Matalamäki, M.J. Effectuation, an emerging theory of entrepreneurship—Towards a mature stage of the development. *J. Small Bus. Enterp. Dev.* **2017**, *24*, 928–949. [CrossRef]
52. Kerr, R.; Coviello, N. Weaving network theory into effectuation: A multi-level reconceptualization of effectual dynamics. *J. Bus. Ventur.* **2020**, *35*, 105937. [CrossRef]
53. Childs, M.; Turner, T.; Sneed, C.; Berry, A. A contingency theory approach to understanding small retail business continuity during COVID-19. *Fam. Consum. Sci. Res. J.* **2022**, *50*, 216–230. [CrossRef]
54. Carnabuci, G.; Diószegi, B. Social networks, cognitive style, and innovative performance: A contingency perspective. *Acad. Manag. J.* **2015**, *58*, 881–905. [CrossRef]
55. Adler, P.S.; Kwon, S.-W. Social capital: Prospects for a new concept. *Acad. Manag. Rev.* **2002**, *27*, 17–40. [CrossRef]
56. Williams, T.A.; Shepherd, D. A Building resilience or providing sustenance: Different paths of emergent ventures in the aftermath of the Haiti earthquake. *Acad. Manag. J.* **2016**, *59*, 2069–2102. [CrossRef]
57. Boschma, R. Proximity and innovation: A critical assessment. *Reg. Stud.* **2005**, *39*, 61–74. [CrossRef]
58. Korsgaard, S.; Hunt, R.A.; Townsend, D.M.; Ingstrup, M.B. COVID-19 and the importance of space in entrepreneurship research and policy. *Int. Small Bus. J. Res. Entrep.* **2020**, *38*, 697–710. [CrossRef]
59. Bosma, N.; Hill, S.; Ionescu-Somers, A.; Kelley, D.; Guerrero, M.; Schott, T. *Global Entrepreneurship Monitor (GEM) 2020/2021 Global Report*; GEM: London, UK, 2021. Available online: https://www.gemconsortium.org/report (accessed on 30 May 2025).
60. Mehta, P.D. Control variable in research. *Int. Encycl. Soc. Behav. Sci.* **2001**, 2727–2730. [CrossRef]
61. Stuart, E.A. Matching methods for causal inference: A review and a look forward. *Stat. Sci.* **2010**, *25*, 1–21. [CrossRef] [PubMed]
62. Austin, P.C. An introduction to propensity score methods for reducing the effects of confounding in observational studies. *Multivar. Behav. Res.* **2011**, *46*, 399–424. [CrossRef]
63. Amoah, J.; Stuart, E.A.; Cosgrove, S.E.; Harris, A.D.; Han, J.H.; Lautenbach, E.; Tamma, P.D. Comparing propensity score methods versus traditional regression analysis for the evaluation of observational data: A case study evaluating the treatment of gram-negative bloodstream infections. *Clin. Infect. Dis.* **2020**, *71*, e497–e505. [CrossRef]
64. Perraillon, M.C.; Owsley, K.M.; Welton, J.M. Propensity scores and regression adjustment. *Nurs. Econ.* **2020**, *38*, 218–221. Available online: https://oce.ovid.com/article/00006073-202007000-00006 (accessed on 20 May 2025).
65. Pinho, J.C.; de Lurdes Martins, M. The opportunity to create a business: Systemic banking crisis, institutional factor conditions and trade openness. *J. Int. Entrep.* **2020**, *18*, 393–418. [CrossRef]
66. Bosma, N.; Content, J.; Sanders, M.; Stam, E. Institutions, entrepreneurship, and economic growth in Europe. *Small Bus. Econ.* **2018**, *51*, 483–499. [CrossRef]
67. Boudreaux, C.J.; Nikolaev, B.N.; Klein, P. Socio-cognitive traits and entrepreneurship: The moderating role of economic institutions. *J. Bus. Ventur.* **2019**, *34*, 178–196. [CrossRef]
68. Bosma, N.; Hill, S.; Ionescu-Somers, A.; Kelley, D.; Levie, J.; Tarnawa, A. *Global Entrepreneurship Monitor (GEM) 2019/2020 Global Report*; GEM: London, UK, 2020. Available online: https://www.gemconsortium.org/report (accessed on 30 May 2025).
69. Peroni, C.; Riillo, C.A.F.; Sarracino, F. Entrepreneurship and immigration: Evidence from GEM Luxembourg. *Small Bus. Econ.* **2016**, *46*, 639–656. [CrossRef]
70. Fernandez, V. Immigrants and the entrepreneurial process: Cross-country evidence. *Int. Entrep. Manag. J.* **2024**, *20*, 761–805. [CrossRef]
71. De Massis, A.; Frattini, F.; Pizzurno, E.; Cassia, L. Product innovation in family versus nonfamily firms: An exploratory analysis. *J. Small Bus. Manag.* **2015**, *53*, 1–36. [CrossRef]
72. Fernandez, V. Family entrepreneurship around the world. *Int. Rev. Financ. Anal.* **2023**, *89*, 102808. [CrossRef]

73. Le Breton-Miller, I.L.; Miller, D. Family businesses under COVID-19: Inspiring models–Sometimes. *J. Fam. Bus. Strategy* **2022**, *13*, 100452. [CrossRef]
74. Leppäaho, T.; Ritala, P. Surviving the coronavirus pandemic and beyond: Unlocking family firms' innovation potential across crises. *J. Fam. Bus. Strategy* **2022**, *13*, 100440. [CrossRef]
75. Soler-Porta, M.; Rodríguez Díaz, B. Family businesses overcoming the COVID-19 crisis with innovation: An exploratory analysis of the jewelry retail sector in Spain. *Sustainability* **2024**, *16*, 2259. [CrossRef]
76. Trunschke, M.; Peters, B.; Czarnitzki, D.; Rammer, C. Pandemic effects: Do innovation activities of firms suffer from Long COVID? *Res. Policy* **2024**, *53*, 105024. [CrossRef]
77. Freixanet, J.; Braojos, J.; Rialp-Criado, A.; Rialp-Criado, J. Does international entrepreneurial orientation foster innovation performance? The mediating role of social media and open innovation. *Int. J. Entrep. Innov.* **2021**, *22*, 33–44. [CrossRef]
78. Du, J.; Zhu, S.; Li, W.H. Innovation through internationalization: A systematic review and research agenda. *Asia Pac. J. Manag.* **2023**, *40*, 1217–1251. [CrossRef]
79. Jiao, A.; Lu, J.; Wei, J.; Zhang, W. Do pro-social CEOs promote innovation? *Financ. Res. Lett.* **2023**, *55*, 103977. [CrossRef]
80. Au, K.; Jeong, S.S.; Hsu, A.J.C.; Xiao, Y. When does prosocial motivation deliver? A dual-motivations approach to social enterprise outcomes. *J. Bus. Ethics* **2024**, *193*, 159–178. [CrossRef]
81. Branzei, O.; Fathallah, R. The end of resilience? Managing vulnerability through temporal resourcing and resisting. *Entrep. Theory Pract.* **2021**, *47*, 831–863. [CrossRef]
82. Anwar, A.; Coviello, N.; Rouziou, M. Weathering a crisis: A multi-level analysis of resilience in young ventures. *Entrep. Theory Pract.* **2021**, *47*, 864–892. [CrossRef]
83. Martina, R.A. Toward a theory of affordable loss. *Small Bus. Econ.* **2020**, *54*, 751–774. [CrossRef]
84. Pereira, H.M.F.; Saes, M.S.M. Government support and institutions' intermediation throughout companies' adaptation to the COVID-19 crisis. *Sustainability* **2022**, *14*, 5450. [CrossRef]
85. Herhausen, D.; Morgan, R.E.; Brozović, D.; Volberda, H.W. Re-examining strategic flexibility: A meta-analysis of its antecedents, consequences and contingencies. *Br. J. Manag.* **2021**, *32*, 435–455. [CrossRef]
86. Gerdeman, D. How the Coronavirus Is Already Rewriting the Future of Business. 2020. Available online: https://hbswk.hbs.edu/item/how-the-coronavirus-is-already-rewriting-the-future-of-business (accessed on 30 May 2025).
87. Lau, C.K.; Zhang, D.; Gozgor, G. Support policies for small businesses during the COVID-19 Crisis: Evidence from club convergence clustering approach. *Emerg. Mark. Financ. Trade* **2023**, *60*, 401–416. [CrossRef]
88. Peráček, T.; Kaššaj, M. Strategic management of urban services using artificial intelligence in the development of sustainable smart cities—Managerial and legal challenges. *Sustainability* **2026**, *18*, 582. [CrossRef]
89. Podsakoff, P.M.; MacKenzie, S.B.; Lee, J.-Y.; Podsakoff, N.P. Common method biases in behavioral research: A critical review of the literature and recommended remedies. *J. Appl. Psychol.* **2003**, *88*, 879–903. [CrossRef] [PubMed]

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