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The Impact of Social Liberalization on Female Entrepreneurship

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Although the impact of institutional change on entrepreneurship is well documented, little is known about how institutional changes influence the creation of high-growth ventures founded by female entrepreneurs. By implementing the difference-in-differences approach, this study examines the impact of a socially liberal policy (i.e., legalization of same-sex marriage) on female entrepreneurship. We show that social liberalization policies may increase the creation of high-growth ventures by female entrepreneurs. We also show that when ethnic minorities are more prevalent, the positive effect of social liberalization on female-founded high-growth ventures is stronger, but that this positive effect might not be driven by necessity entrepreneurship. A supplementary analysis with a funding round level sample shows that after controlling for ventures, founders, and industry characteristics, social liberalization tends to increase the amount of early-stage funding that women entrepreneurs receive. This study extends prominent literature on female entrepreneurial entry and offer practical implications for policymakers by shedding lights on the impact of social liberalization on the entry of women to entrepreneurship. This study also extends the emerging literature examining the effect of an institutional change on certain types of entrepreneurship by showing that an institutional change can foster female-founded high growth ventures.

Introduction

Despite increasing participation in entrepreneurship, women are still underrepresented in high-growth sectors such as web, software, mobile, and life sciences (Robb et al., 2014; Scott & Shu, 2017). Extant literature has documented factors that influence the entry of women to entrepreneurship. One stream suggests that personal characteristics such as social capital, self-confidence, education, and risk preference may influence female entrepreneurial entry (Brush, 1992; Chowdhury et al., 2019; Laudano et al., 2018; Rodriguez & Santos, 2009; Verheul et al., 2005; Zhang et al., 2009). Another stream of the literature suggests that social and institutional contexts may influence women's decision to become an entrepreneur (Bui et al., 2018; Carrasco, 2014; Estrin & Mickiewicz, 2011; Gupta et al., 2009; Hattab, 2010). Indeed, broad social and institutional forces may have a strong impact on a prospective founder's decision to enter entrepreneurship (R. Conti et al., 2022; Ko & Liu, 2021; Li, 2020; Raza et al., 2018; Wu & Li, 2020), and gender stereotypes and bias against women entrepreneurs arising in social contexts are key obstacles to female participation (Gupta et al., 2009; Liao et al., 2023; Lippa, 2002; Marlow & Patton, 2005). Although the impact of institutional change on entrepreneurship is well documented (R. Conti et al., 2022; Eesley, 2016; Ko & Liu, 2021; Sine et al., 2005; Sine & David, 2010), little is known about how institutional changes influence the creation of *high-growth ventures* founded by *female* entrepreneurs.

To fill this gap in the literature, this study examines how social liberalization influences a woman's decision to start a high-growth venture, defined as a venture seeking rapid growth through equity capital in technology and science-focused sectors such as web, software, mobile, and life sciences (Robb et al., 2014; Scott & Shu, 2017). We propose that social liberalization may encourage female entrepreneurship via two mechanisms: 1) by promoting interactions with people from diverse gender, racial, and ethnic backgrounds, which may provide the opportunity to access diverse knowledge and spawn entrepreneurial ideas; and 2) by reducing the stereotypes of and bias against women entrepreneurs by affecting views on diversity and openness.

To examine this hypothesis, we took the data from high-growth ventures founded in the U.S. between 2000–2018. We implemented a difference-in-differences (DD) method by exploiting the staggered implementation of a socially liberal policy, same-sex marriage laws, across the U.S. between 2004–2015. Using legalized same-sex marriage laws as a proxy for social liberalization is appropriate for the purposes of this study since it may have a greater influence on public opinion regarding gender and racial diversity than other liberal policies such as legalized marijuana use (Flores & Barclay, 2016; Kreitzer et al., 2014; Nikolaou, 2022). Our state-level analysis compared the changes in the ratio of female entrepreneurial entry from states that implemented such a policy in a particular year relative to those states that have not yet experienced it. Our estimates controlled for longitudinal measures such as economic con-

dition, political orientation, access to financial resources, and human capital, and included state-fixed effects and year-fixed effects.

We found that social liberalization tends to increase the ratio of high growth ventures founded by female entrepreneurs. Exploring potential mechanisms, we find that a greater prevalence of ethnic minorities in the population, which may promote women's interactions with people with diverse backgrounds, results in a more positive effect of social liberalization on high growth ventures founded by female entrepreneurs. In order to see whether our results are driven by women's creation of high growth ventures rather than women's necessity entrepreneurship, we also examine the moderating effect of unemployment rate on the relation between social liberalization and female-founded high-growth ventures. We do not find evidence that our results were driven by women's necessity entrepreneurship. In addition, a supplementary analysis with a funding round sample shows that after controlling for venture, founder, and industry conditions, high-growth ventures founded by female entrepreneurs are more likely to receive early-stage funding following the implementation of such policy.

Our results contribute to the literature. First, this study extends prominent literature on female entrepreneurial entry by shedding lights on the impact of social liberalization on the entry of women to entrepreneurship. Our findings show that the enactment of a socially liberal policy may reduce gender stereotypes and bias against women entrepreneurs arising in social contexts, key obstacles to female participation, and this may in turn increase women entrepreneurship. Second, this study contributes to the literature on institutional entrepreneurship. Extending the emerging literature that examines how an institutional change promotes certain types of entrepreneurship, we explore how an institutional change, legalization of same-sex marriage, fosters high growth ventures founded by female entrepreneurs. Our results also offer practical implications for policymakers by highlighting the social contexts that promote female entrepreneurship.

Literature and Hypothesis

Entrepreneurship scholars have examined how social, economic and political institutions can influence entrepreneurial entry (Dobbin & Dowd, 1997; Lee et al., 2011; Patel & Devaraj, 2022; Sine et al., 2005), as well as the types (Boudreaux et al., 2019; Carrasco, 2014; Eesley, 2016; Estrin & Mickiewicz, 2011) and quality of entrepreneurship (R. Conti et al., 2022). Policymakers are also interested in how institutional change may affect entrepreneurship. While earlier work in entrepreneurship has focused on how institutional change can influence entrepreneurship by lowering the barriers to entry (Dobbin & Dowd, 1997; Lee et al., 2011; Sine et al., 2005), recent studies have examined how institutional change can promote specific types of entrepreneurship (such as entrepreneurship by individuals with high human capital) (Eesley, 2016) and the quality of entrepreneurship (R. Conti et al., 2022).

The literature on female entrepreneurship has also documented the influence of institutional contexts on females'

decisions to become an entrepreneur. This body of literature suggests that social and institutional contexts may create the stereotypes and biases that work against female entrepreneurs and this in turn reduces women's entry into entrepreneurship (Bui et al., 2018; Estrin & Mickiewicz, 2011; Gupta et al., 2009; Junaid et al., 2019). For instance, Junaid and colleagues (2019) also show that informal institutions such as negative, misinterpreted religious beliefs about women embedded in societal contexts may discourage women from becoming an entrepreneur. Likewise, institutional components of discrimination against women (e.g., restrictions on freedom of movement away from home) and government's interference in women's business operations reduces women's entrepreneurial aspirations (Bui et al., 2018; Estrin & Mickiewicz, 2011). Finally, people's perception of entrepreneurship as a masculine profession negatively influences females' entrepreneurial entry (Gupta et al., 2009).

Building on the literature, this study examines how the implementation of a socially liberal policy (i.e., legalization of same-sex marriage) may influence the creation of high growth ventures by female entrepreneurs. We expect social liberalization to promote the creation of high growth ventures by female entrepreneurs through two mechanisms. First, it may promote entrepreneurial ventures founded by women by increasing women's social interactions with groups that come from diverse gender, racial, and ethnic backgrounds. A recent study shows that socially liberal policies increase social interactions among groups possessing diverse knowledge, thereby increasing the recombination of a novel set of diverse knowledge (Vakili & Zhang, 2018). Studies in the fields of sociology, psychology, and political science also suggest that social contexts often shape individual interactions and creative output (Edmondson, 1999; Flores & Barclay, 2016; Gilfillan, 1970; Perry-Smith, 2006), and that socially liberal contexts are associated with increased interactions among diverse groups of individuals (Heller, 1996; Levi, 1996; Szalacha, 2003; Tandler & Freedheim, 1994; Woolcock & Narayan, 2000). For instance, individuals who hold more liberal views generally have a lower level of racial awareness when it comes to dating (Anderson et al., 2014). Given that lower social capital stemming from fewer social interactions is one reason for lower levels of female entrepreneurial entry (Greene, 2000; Rodriguez & Santos, 2009), a socially liberal policy that promotes social interactions with people from diverse backgrounds may augment women's social capital and help promote their entry to entrepreneurship. Given that the creation of new ideas requires a combination of diverse perspectives and knowledge (Fleming, 2001; Kaplan & Vakili, 2015), increased interactions with diverse ethnicities, races, and genders may help create more entrepreneurial opportunities for women.

Second, social liberalization may reduce the stereotypes and bias that work against female entrepreneurs by broadening individual views on diversity and openness (Heller, 1996; Levi, 1996; Szalacha, 2003; Tandler & Freedheim, 1994; Woolcock & Narayan, 2000). People tend to categorize others based on personal experiences (Kahneman,

2011); such categorization is used to form social judgments, a tendency that can harden into attitudes and beliefs over time (Massey, 2007). Stereotypes and bias regarding female entrepreneurs are prevalent, including viewing entrepreneurial activity as a masculine trait (Gupta et al., 2009; Laguía et al., 2019) and associating women with a lower level of knowledge and skill (Allen et al., 2007). Such beliefs systems can lead to active discrimination against female entrepreneurs. Social liberalization can mitigate such belief systems by promoting more broadminded attitudes towards gender diversity. Studies have shown that liberal policies do change public opinions. For instance, public acceptance of minority rights became more widespread after the U.S. Supreme Court ruling in *Varnum v. Brien* which established same sex marriage (Kreitzer et al., 2014). Legalization of same-sex marriage promoted public openness toward gay individuals (Flores & Barclay, 2016) and has reduced the number of sexually oriented hate crimes (Nikolaou, 2022). In the same way, socially liberal views that enhance public openness to diversity and different lifestyles may reduce the stereotypes and bias that work against female entrepreneurs and increase the chance that females will choose to become entrepreneurs.

To summarize, prospective female entrepreneurs may increase interactions with groups and individuals from diverse ethnic, race and gender backgrounds following the implementation of a socially liberal policy and this may lead to greater knowledge and generate more creative ideas. Stereotypes and bias against female entrepreneurs may decrease, due to greater public openness following the implementation of a socially liberal policy. Thus, we hypothesize:

Hypothesis 1: The implementation of a socially liberal policy will increase the share of high growth ventures founded by female entrepreneurs.

Methods and Sample

Our sample was drawn from Crunchbase, an online public platform that compiles detailed information on high-growth ventures, technology firms, and investors, including biographies of founders, investors, and key employees, startup products and technologies, and funding amounts and rounds. The Crunchbase database covers early-stage ventures, funded and unfunded, found in high-growth sectors, such as Web, mobile, software, and life sciences, in which there are often fewer female entrepreneurs than male (Scott & Shu, 2017). Due to its coverage of early-stage high-growth ventures, it has been widely used in recent studies of high growth ventures and entrepreneurial financing (Bellavitis et al., 2021; A. Conti & Roche, 2021; Duke et al., 2021; Roche et al., 2020). In recent years Crunchbase data have become more comprehensive; thus, we include ventures founded since 2000 and exclude those founded

after 2018, due to the potential impact of COVID-19. Indeed, since same-sex marriage was legalized across all US states by 2015, incorporating data beyond 2019 might introduce confounding factors due to the extraordinary economic conditions of the pandemic. We retain all the ventures with founding team information which is required to identify female founders. Using the high-growth venture data from Crunchbase, we construct our state level sample, and our final sample is comprised of 969 state-year observations between 2000 and 2018. In the final sample, a state-year observation has 121.20 newly founded high-growth ventures on average¹.

As noted, we took the legalization of same-sex marriage as a proxy for social liberalization. Social and institutional contexts in favor of same-sex marriage laws are broadly linked to a liberal mindset and agenda (Kane, 2003; Soule, 2004; Soule & Earl, 2001). Table 1 shows the effective year of same-sex marriage laws; we exploited a variation in the timing of same-sex marriage laws across different states as a quasi-natural experiment in order to estimate the effect of such a policy on rates of female entrepreneurship. Prominent extant literature implemented the difference-in-differences (DD) method to examine the effects of the implementation of state-level policies/laws on entrepreneurship since implementing the DD method minimizes the influences of potentially omitted variables and addresses potential endogeneity concerns (Castellaneta et al., 2016; e.g., R. Conti et al., 2022; Patel & Devaraj, 2022; Vakili & Zhang, 2018). Following these studies, we implemented the DD method by comparing the change in the share of high growth ventures founded by females in states where same-sex marriage became law to those where it has not, and estimated the following specification:

$$Y_{st+1} = \beta_1 \text{Social Liberalization}_{st} + \beta_2 X_{st} + \beta_3 \text{State}_s + \beta_4 \text{Year}_t + \varepsilon_{st}$$

where Y_{st+1} is the ratio of the number of high-growth ventures founded by females to the total number of high-growth ventures founded in a state in a year. Social liberalization was equal to 1 after state s implemented same-sex marriage law in year t . X_{st} is a vector of control variables that accounts for time-varying, state-specific conditions. State s and Year t are state and year fixed effects to control for time-invariant characteristics of states and changes that affect states to a similar degree, respectively. We used Stata software and implemented ordinary least squares (OLS) where standard errors are clustered by state and year to adjust for autocorrelation (Huang et al., 2017; Patel & Devaraj, 2022; Petersen, 2009). The results remain similar when standard errors are clustered by state.

Dependent variable

We measured *share of female-founded high growth ventures* as the ratio of the number of high-growth ventures

¹ Standard deviation is 332.673. Some states have a larger number of high-growth ventures founded in a year; for instance, in 2014, 3,482 high-growth ventures were founded in California.

where at least one founder was female to the total number of high-growth ventures founded in a state in a year. We identified female founders using Crunchbase's Diversity Spotlight² and downloaded the information through CrunchBase API. As noted, on average, there were 121.20 high-growth ventures founded in a state in a year and the dependent variable is measured as the rate of female founded ventures to total number of ventures founded in a state in a year. Robustness checks were conducted running a Poisson regression with the number of high-growth ventures founded by women as alternative dependent variable.

Control variables

We measured *Funding* (log) as the logarithm of the total amount of funding in US dollars invested in high-growth ventures in a state in a given year and this data was obtained from Crunchbase. We also controlled for *population*, *share of minority*, and *share of women* (derived from the Census Bureau), measured as the population in a state in a given year, proportion of minorities in a state in one year, and proportion of women in a state in that year, respectively. *Income per capita* (derived from the Census Bureau). We also included *unemployment rate* to control for economic conditions that might influence venture founding rate and we obtained state-level unemployment information from U.S. Bureau of Labor Statistics. To control for state political trends that might influence the adoption of same-sex marriage laws and their impact on venture creation, *Red state governor* was used as a dummy variable measured as 1 if a state had a Republican governor, and zero otherwise.³

Results

Table 2 reports summary statistics and pairwise correlations between variables.⁴ Table 3 reports the results of the Ordinary Least Squares (OLS) regressions for the effect of social liberalization on share of female-founded high-growth ventures. We argue that social liberalization has a positive, significant effect on female entrepreneurial entry. As shown in Model 1, the coefficient estimate for *social liberalization* was positive and significant ($\beta = 0.023$, $p = 0.034$), thus supporting our hypothesis. In Table 4, we also conducted robustness checks by running a Poisson regression, with number of female-founded high-growth ventures as a dependent variable. As shown in Table 4, the coefficient estimate for *social liberalization* was positive and significant ($\beta = 0.050$, $p = 0.089$), indicating that when same-sex marriage laws are enacted, high-growth ventures founded by women increased by 5.1% ($e^{0.050} - 1 = 0.051$), an economically significant effect.

Potential mechanisms to explain the positive effect of social liberalization on the creation of high-growth ventures by female entrepreneurs include the moderating effect of minorities in the population, assuming a higher ratio of minorities will promote social interactions among diverse gender, ethnic and racial group. As shown in Table 3, the coefficient estimate for *social liberalization* $\times$ *share of minority* was positive and significant ($\beta = 0.106$, $p = 0.022$ in Model 2 and $\beta = 0.103$, $p = 0.020$ in Model 4). We conducted robustness checks in Table 4 using number of female-founded high-growth ventures as dependent variables and running a Poisson regression and the coefficient estimate for *social liberalization* $\times$ *share of minority* was positive and significant ($\beta = 0.795$, $p = 0.007$ in Model 2 and $\beta = 0.791$, $p = 0.009$ in Model 4). These findings show that women's interactions with diverse groups may serve as a potential mechanism to promote entrepreneurial ventures: a greater prevalence of minorities in a population may increase female interactions with diverse groups and ideas, leading to greater rates of female entrepreneurship.

We also examined the moderating effect of unemployment rates. If our results were driven by women's necessity entrepreneurship, the unemployment rate may strengthen the relationship between social liberalization and female entrepreneurship. In this study, we argue that social liberalization increases creative ideas that lead to founding of high-growth ventures by female entrepreneurs while ventures created due to necessity entrepreneurs often have limited growth potential and resemble existing businesses (Dencker et al., 2009). The coefficient estimate for *social liberalization* $\times$ *unemployment rate* was positive but insignificant ($\beta = 0.004$, $p = 0.489$ in Model 2 and $\beta = 0.001$, $p = 0.797$ in Model 4), confirming that our results were not driven by necessity entrepreneurship. In the robustness check using a Poisson model in Table 4, the coefficient estimate for *social liberalization* $\times$ *unemployment rate* was also not significant ($\beta = 0.014$, $p = 0.486$ in Model 2 and $\beta = 0.001$, $p = 0.958$ in Model 4). Thus, our results showed that the unemployment rate had an insignificant effect on the relationship between social liberalization and creation of high-growth ventures by women. We cautiously conclude that our main findings were not driven by any increase in necessity entrepreneurship by women.

Robustness checks and supplementary analysis

To check the robustness of our findings, we conducted sensitivity analyses. The DD analytic approach assumes no preexisting trends. In order to test this assumption, we replaced the *social liberalization* variable with nine dummy variables representing the four years leading up to a so-

2 Crunchbase Diversity Spotlight provides information about minority founders including Black/African American, American Indian, East Asian, Hispanic/Latinx, Middle Eastern, Native Hawaiian/Pacific Islander, South Asian, Southeast Asian, and women.

3 Information about mayoral political orientation was used for the District of Columbia since the office of mayor functions as that of governor of a state.

4 High correlations between state-level variables are common (e.g., Doblinger et al., 2020). However, our results hold up using regression results that don't have variables with high correlations such as income per capita or population.

Table 1. Legalization Years of Same Sex Marriage Law

State	Same Sex Marriage Law Enactment
Alabama	2015
Alaska	2014
Arizona	2014
Arkansas	2015
California	2013
Colorado	2014
Connecticut	2008
District of Columbia	2010
Delaware	2013
Florida	2015
Georgia	2015
Hawaii	2013
Idaho	2014
Illinois	2013
Indiana	2014
Iowa	2009
Kansas	2015
Kentucky	2015
Louisiana	2015
Maine	2012
Maryland	2013
Massachusetts	2004
Michigan	2015
Minnesota	2013
Mississippi	2015
Missouri	2015
Montana	2014
Nebraska	2015
Nevada	2014
New Hampshire	2010
New Jersey	2013
New Mexico	2013
New York	2011
North Carolina	2014
North Dakota	2015
Ohio	2015
Oklahoma	2014
Oregon	2014
Pennsylvania	2014
Rhode Island	2011
South Caroline	2014
South Dakota	2015
Tennessee	2015
Texas	2015
Utah	2014
Vermont	2009
Virginia	2014
Washington	2012
West Virginia	2014
Wisconsin	2014
Wyoming	2014

cially liberal policy (SL), including SL (-4), SL (-3), SL (-2), SL (-1); the year of social liberalization SL (0); the first, second, and third years after social liberalization, including SL (1), SL (2), and SL (3); and finally four or more years following social liberalization SL (4+). As shown in [Table 5](#), pre-liberalization dummies as well as the liberalization-year dummy were insignificant, while following social liberalization, female entrepreneurial founding rates significantly increased.

Second, in order to examine the effect of any potential impact of omitted variables correlated with the enactment of same-sex marriage, we create pseudo (placebo) treatments by setting the treatment year to $t - 4$ or $t + 4$ relative to the actual implementation year, following prior research (Huang & Kim, 2019; Morandi Stagni et al., 2020). As shown in [Table 6](#), the results indicate that the placebo treatments do not significantly affect female entrepreneurship. In Model 1, where the treatment year was set to $t - 4$ relative to the actual implementation year, the coefficient estimate for *social liberalization* was positive but insignificant ($\beta = 0.017$, $p = 0.200$), while in Model 3, where the treatment year was set to $t + 4$, the coefficient estimate for *social liberalization* was negative and insignificant ($\beta = -0.018$, $p = 0.196$). Further, the coefficient estimate for *social liberalization* $\times$ *share of minority* was positive but insignificant ($\beta = 0.037$, $p = 0.387$ in Model 2 and $\beta = 0.035$, $p = 0.637$ in Model 4). Similarly, the coefficient estimate for *social liberalization* $\times$ *unemployment rate* was negative but insignificant in Model 2 ($\beta = -0.005$, $p = 0.187$), while it was positive but insignificant in Model 4 ($\beta = 0.008$, $p = 0.155$). These findings suggest that omitted variables, such as macro-trends in female entrepreneurship and infrastructure supporting female entrepreneurship, do not underlie our main results. If these omitted variables were influencing our findings, we would expect the placebo treatments to affect founding rates by female entrepreneurs, regardless of the same-sex marriage law implementation.

Third, our results remain similar in alternative regression models, including the model that omits *funding* variable that has a high correlation with other variables, the one that includes an additional variable, *bachelor's degree rate*, that has a high correlation with *income per capita* (0.81), and the model where standard errors are clustered by state instead of state and year.

We conduct a supplementary analysis to examine if social liberalization also increases funding raised by women entrepreneurs. We constructed fund-round level samples and implemented the difference-in-differences (DD) approach to identify the impact of social liberalization on funding raised by women over individual funding rounds. Access to finance is one of the most critical factors in the survival and growth of any venture (Canning et al., 2012; Cavalluzzo et al., 2002; Coleman & Robb, 2009; Sørensen & Sharkey, 2014), and lack of initial investment may be one of the reasons for the lower level of women's entrepreneurial entry (Sharma, 2021). To construct panel data, a requirement of DD analysis, we excluded firms with only one (or no) funding round. We controlled for firm-level characteristics including venture age, venture size (number of

Table 2. Descriptive Statistics and Pairwise Correlations

	Variables	Mean	Std. Dev.	1.	2.	3.	4.	5.	6.	7.
1.	Share of female-founded high growth ventures	0.10	0.08							
2.	Funding (log)	17.23	5.41	0.19						
3.	Population (log)	15.10	1.03	0.08	0.54					
4.	Share of minority	0.20	0.13	0.09	0.09	0.09				
5.	Share of female	0.51	0.01	0.08	0.23	0.29	0.27			
6.	Income per capita	40279.65	9628.49	0.32	0.37	-0.01	0.22	0.02		
7.	Unemployment rate	5.62	1.98	0.18	0.16	0.22	0.17	0.16	-0.02	
8.	Red governor	0.55	0.50	-0.06	-0.05	0.02	-0.06	-0.15	-0.10	-0.10

Note. N = 969; correlations greater than 0.08 are significant at $p < 0.05$.

founders), and venture prominence, operationalized as the rankings provided by Crunchbase (Bellavitis et al., 2021); founder educational background including ratio of founders that hold a Ph.D. degree, a business degree, and/or degree from an Ivy League school; and industry fixed effects using industry groups self-reported in Crunchbase. Table 7 shows that before the implementation of socially liberal policies, high-growth ventures founded by women were more likely to receive a smaller amount of seed funding as shown in Model 1 ($\beta = -0.339$, $p = 0.000$) and smaller amounts of early-stage funding as shown in Model 3 ($\beta = -0.352$, $p = 0.000$). However, following the implementation of socially liberal policies, high-growth ventures founded by women were more likely to receive larger amounts of seed funding ($\beta = 0.271$, $p = 0.004$ in Model 2) or early-stage funding ($\beta = 0.299$, $p = 0.004$ in Model 4), which we define as the sum total of seed, series A, or series B funding⁵. Thus, high-growth ventures founded by women are more likely to receive funding, given the enactment of socially liberal policies after controlling for venture and founder characteristics, and industry fixed effects.

Discussion

Women are underrepresented when it comes to entrepreneurship, especially high-growth ventures. The extant literature suggests that individual attributes and social and institutional contexts may influence a female's decision to become an entrepreneurship. Drawing on the literature, we argue that following implementation of a socially liberal policy, i.e., same-sex marriage law, women may increase their interactions with different ethnicities, races, and genders, leading to a combination of diverse knowledge and generation of creative ideas. The socially liberal policy may also influence the public's view of diversity and reduce stereotypes of and bias against female entrepreneurs. Therefore, we argue that creation of high-growth ventures by women may increase after the implementation of the social liberal policy. Overall, our results support such a hypothesis. Our supplementary analyses show that the prevalence of a minority in a population strengthens the positive impact of a socially liberal policy on female-founded high growth ventures, but such a positive effect might not be driven by necessity entrepreneurship. The results show that our results are driven by women's increased their interactions with different ethnicities, races, and genders where minorities in a population are more prevalent and that our results were not driven by women's necessity entrepreneurship.

This study offers an important contribution to scholarship on women's entrepreneurial entry. Creating a high-growth venture requires a potential entrepreneur to generate more creative ideas. Our study shows that women's increased interactions with diverse ethnicities, races, and genders upon the implementation of a socially liberal pol-

icy help them combine diverse knowledge and generate creative ideas, thereby increasing the creation of female-founded high-growth ventures. Thus, this study suggests that a liberal social context may promote the generation of creative entrepreneurial ideas and help increase female entrepreneurs' presence in high growth sectors. Our results also offer practical implications for policymakers by highlighting how liberal social contexts can promote female entrepreneurship. It is important to emphasize that socially liberal policies can have a strong impact on not only people's view on diversity and openness but also females' decision to start a high-growth venture.

This study also makes contributions to the institutional entrepreneurship literature by shedding light on the impact of socially liberal policies on female entrepreneurial entry. Prominent research on institutional entrepreneurship examines how institutional change can promote/impede entrepreneurial entry. However, emerging literature starts examining how institutional change can promote/impede specific types of entrepreneurship and the quality of entrepreneurship. Extending the literature, this study shows that implementation of a socially liberal policy may promote the creation of high growth ventures founded by female entrepreneurs.

Limitations and future study

This study is not without limitations. First, although we draw on prior studies suggesting that social liberalization influences overall views on diversity and openness, we did not directly examine such views. Future scholars may survey the founders of high-growth ventures to see whether socially liberal policies influence their views on diversity, specifically female founders. We also lacked detailed data on social interactions among individuals of diverse races, ethnicities, and genders. It would be intriguing to explore how founders' social interactions might evolve following social liberalization. Future researchers could analyze co-inventor information on patent applications or survey startup founders to investigate changes in interactions after the adoption of socially liberal policies.

Second, this study considers women as a monolithic group. However, it is important to understand the variation of female entrepreneurship within this social category (Jennings & Brush, 2013; Wang, 2013). For instance, female entrepreneurs may be categorized into different social categories (e.g., Blacks, LatinX, LGBTQ+, etc.), and future research may examine whether women could be doubly disadvantaged as a woman based on other social categories. For instance, a white woman may have more advantages than a non-binary woman or a Black woman when starting a new business and seeking external funding necessary to run the business.

Third, our study focused on high-growth ventures to examine the impact of social liberalization on female entre-

⁵ Results were similar even after using subsamples that included seed stage funding rounds or early-stage funding rounds (seed, series A and series B) instead of all funding rounds dummy variables.

Table 3. OLS Regression Analyses: The Effect of Social Liberalization on The Share of Female-Founded High Growth Ventures

Variables	Model 1	Model 2	Model 3	Model 4
Social liberalization (SL)	0.023** [0.011]	0.002 [0.015]	0.000 [0.037]	-0.005 [0.037]
SL × share of minority		0.106** [0.046]		0.103** [0.044]
SL × unemployment rate			0.004 [0.005]	0.001 [0.005]
Funding (log)	-0.001 [0.001]	-0.001 [0.001]	-0.001 [0.001]	-0.001 [0.001]
Population (log)	0.060 [0.100]	0.050 [0.099]	0.065 [0.099]	0.052 [0.097]
Share of minority	-0.472** [0.239]	-0.279 [0.256]	-0.451* [0.238]	-0.276 [0.256]
Share of female	-3.672 [3.992]	-5.036 [4.067]	-3.938 [3.920]	-5.098 [4.020]
Income per capita	0.003 [0.014]	-0.003 [0.015]	0.001 [0.014]	-0.004 [0.015]
Unemployment rate	0.007** [0.003]	0.006* [0.003]	0.007* [0.004]	0.006* [0.004]
Red governor	-0.001 [0.006]	0.000 [0.006]	-0.001 [0.006]	0.000 [0.006]
Constant	1.056 [1.174]	1.814 [1.211]	1.119 [1.162]	1.818 [1.210]
State fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Observations	969	969	969	969
R-squared	0.251	0.256	0.252	0.256

Note. *** p<0.01, ** p<0.05, * p<0.1; two-tailed tests; standard errors clustered by state and year are in brackets.

preneurship. Therefore, it is unclear whether our findings are generalizable to other types of entrepreneurial endeavors, such as traditional small businesses or corporate entrepreneurship. Future research could investigate how our findings translate to these varied contexts. Furthermore, considering that reward and donation-based crowdfunding often yield different funding outcomes by founder gender (Elitzur & Solodoha, 2021; Solodoha & Blaywais, 2023), examining the impact of social liberalization on female entrepreneurship within crowdfunding platforms would be intriguing.

Fourth, this study contributes to the literature on female entrepreneurship by examining the impact of social liberalization on the founding rates of female entrepreneurs. However, it does not explore how founder- or firm-level characteristics might influence female entrepreneurship following the implementation of socially liberal policies. Factors such as the education and entrepreneurial experience of the founder, firm size, and gender dynamics among a startup's founders could affect the firm's response to socially liberal policies. Future research could investigate the effects of these founder- or firm-level characteristics.

Data availability statement

The data that support the findings of this study are openly available in Harvard Dataverse at <https://doi.org/10.7910/DVN/IWTE10>.

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Table 4. Poisson Regression Analyses: The Effect of Social Liberalization on The Number of Female-Founded High Growth Ventures

Variables	Model 1	Model 2	Model 3	Model 4
Social liberalization (SL)	0.050*	-0.150*	-0.054	-0.157
	[0.029]	[0.082]	[0.159]	[0.162]
SL × share of minority		0.795***		0.791***
		[0.295]		[0.301]
SL × unemployment rate			0.014	0.001
			[0.020]	[0.020]
Funding (log)	0.023	0.022	0.024	0.022
	[0.015]	[0.014]	[0.015]	[0.014]
Population (log)	-0.785	-0.642	-0.766	-0.641
	[0.504]	[0.504]	[0.503]	[0.504]
Share of minority	-1.020	0.427	-0.897	0.429
	[1.868]	[1.941]	[1.872]	[1.942]
Share of female	30.888*	19.930	28.443	19.796
	[17.235]	[18.234]	[17.657]	[18.421]
Income per capita	0.425***	0.347***	0.413***	0.346***
	[0.079]	[0.085]	[0.083]	[0.087]
Unemployment rate	0.057***	0.050***	0.058***	0.050***
	[0.014]	[0.014]	[0.014]	[0.014]
Red governor	-0.104***	-0.111***	-0.105***	-0.111***
	[0.030]	[0.030]	[0.030]	[0.031]
Constant	-9.274	-6.035	-8.366	-5.981
	[8.836]	[8.945]	[9.006]	[9.038]
State fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Observations	969	969	969	969
Log-likelihood	-1950.716	-1946.702	-1950.448	-1946.701

Note. *** p<0.01, ** p<0.05, * p<0.1; two-tailed tests; standard errors clustered by state and year are in brackets.

Table 5. The Pre-Existing Trends Relative to Social Liberalization (SL)

Variables	Model 1
SL -4	-0.005 [0.012]
SL -3	-0.002 [0.015]
SL -2	0.019 [0.017]
SL -1	0.025 [0.023]
SL -0	0.029 [0.022]
SL 1	0.047** [0.024]
SL 2	0.037 [0.024]
SL 3	0.050** [0.025]
SL 4+	0.079*** [0.028]
Constant	1.070 [1.172]
Control variables	Yes
State fixed effects	Yes
Year fixed effects	Yes
Observations	969
R-squared	0.261

Note. *** p<0.01, ** p<0.05, * p<0.1; two-tailed tests;
Standard errors clustered by state and year are in brackets.

Table 6. Placebo Test Results: OLS Regression Analyses

Variables	Model 1	Model 2	Model 3	Model 4
	Placebo t – 4		Placebo t + 4	
Social liberalization (SL)	0.017	0.044	-0.018	-0.063
	[0.013]	[0.034]	[0.014]	[0.043]
SL × share of minority		0.037		0.035
		[0.043]		[0.074]
SL × unemployment rate		-0.005		0.008
		[0.004]		[0.006]
Funding (log)	-0.001	-0.001	-0.001	-0.001
	[0.001]	[0.001]	[0.001]	[0.001]
Population (log)	0.042	0.026	0.017	0.004
	[0.098]	[0.100]	[0.094]	[0.093]
Share of minority	-0.473*	-0.441	-0.480**	-0.406
	[0.244]	[0.270]	[0.243]	[0.271]
Share of female	-3.323	-3.235	-2.824	-3.010
	[3.954]	[4.221]	[3.868]	[3.895]
Income per capita	0.007	0.006	0.012	0.010
	[0.014]	[0.015]	[0.015]	[0.015]
Unemployment rate	0.007**	0.009**	0.008**	0.007**
	[0.003]	[0.004]	[0.004]	[0.004]
Red governor	-0.003	-0.003	-0.003	-0.002
	[0.006]	[0.006]	[0.006]	[0.006]
Constant	1.114	1.278	1.194	1.438
	[1.174]	[1.244]	[1.178]	[1.206]
State fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Observations	969	969	969	969
R-squared	0.250	0.252	0.250	0.251

Note *** p<0.01, ** p<0.05, * p<0.1; two-tailed tests; standard errors clustered by state and year are in brackets.

Table 7. The Effect of Social Liberalization on Funding Raised by Ventures in Individual Rounds

Variables	Model 1	Model 2	Model 3	Model 4
	Funding stage: Seed		Funding stage: Early Rounds	
Social liberalization (SL)	0.034 [0.032]	-0.125*** [0.035]	0.018 [0.033]	-0.236*** [0.038]
High growth ventures by female entrepreneurs (Female)	-0.339*** [0.030]	-0.316*** [0.061]	-0.352*** [0.031]	-0.306*** [0.086]
Funding stage	-1.007*** [0.019]	-1.450*** [0.031]	0.483*** [0.017]	0.150*** [0.025]
SL × Female		-0.141** [0.070]		-0.190** [0.094]
SL × Funding stage		0.562*** [0.037]		0.477*** [0.033]
Female × Funding stage		0.049 [0.082]		-0.046 [0.091]
SL × Female × Funding stage		0.271*** [0.095]		0.299*** [0.104]
Venture age	0.120*** [0.004]	0.118*** [0.004]	0.159*** [0.004]	0.157*** [0.004]
Venture prominence	0.000*** [0.000]	0.000*** [0.000]	0.000** [0.000]	0.000** [0.000]
Venture size	0.172*** [0.010]	0.174*** [0.010]	0.166*** [0.010]	0.167*** [0.010]
Ph.D. ratio	0.146*** [0.055]	0.143*** [0.055]	0.201*** [0.055]	0.203*** [0.055]
Business degree ratio	0.049 [0.036]	0.053 [0.036]	0.043 [0.037]	0.046 [0.037]
Ivy league degree ratio	0.423*** [0.036]	0.424*** [0.036]	0.448*** [0.037]	0.448*** [0.037]
Constant	15.015*** [0.388]	15.030*** [0.386]	14.251*** [0.289]	14.435*** [0.282]
State fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Funding round fixed effects	Yes	Yes	Yes	Yes
Venture industry fixed effects	Yes	Yes	Yes	Yes
Observations	72,433	72,433	72,433	72,433
Number of firms	24,483	24,483	24,483	24,483
R-squared	0.319	0.323	0.292	0.297

Note. *** p<0.01, ** p<0.05, * p<0.1; two-tailed tests; standard errors are in brackets; standard errors are clustered at firm-level.



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