



# Venture Capital and the Gender Financing Gap: The Role of Accelerators

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IN PARTNERSHIP WITH



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### **World Bank Africa Gender Innovation Lab (GIL)**

conducts impact evaluations, which assess the outcome of development interventions in sub-Saharan Africa to generate evidence on how to close the gender gap in earnings, productivity, assets, and agency. With the results of impact evaluations, GIL supports the design of innovative, scalable interventions to address gender inequality across Africa. The goal is to enable project teams and policymakers to advocate for better gender integration using evidence.

### **The Global Accelerator Learning Initiative (GALI)**

is a collaboration between the Aspen Network of Development Entrepreneurs (ANDE) and Social Enterprise @ Goizueta (SE@G) at Emory University. GALI is designed to explore and answer key questions about enterprise acceleration, such as: Do acceleration programs contribute to revenue growth? Do they help early-stage ventures attract investment? Do they work differently for different types of entrepreneurs? GALI builds on the Entrepreneurship Database Program at Emory University, which works with accelerator programs around the world to collect data describing the entrepreneurs that they attract and support.

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## Abbreviations and Acronyms

<b>ANDE</b>	Aspen Network of Development Entrepreneurs
<b>CY</b>	Calendar Year
<b>GALI</b>	Global Accelerator Learning Initiative
<b>GIL</b>	Gender Innovation Lab
<b>IFC</b>	International Finance Corporation
<b>OLS</b>	Ordinary Least Squares
<b>We-Fi</b>	Women Entrepreneurs Finance Initiative

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# Acknowledgements

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This publication was developed under the overall guidance of William Sonneborn, Senior Director, Disruptive Technologies and Funds, IFC, and Allie Burns, CEO, Village Capital. The core working group of the initiative — jointly led by Shruti Chandrasekhar, Head, SME Ventures & Startup Catalyst, IFC, and Heather Matranga, Senior Director, Strategic Innovations, Village Capital — comprises Stephanie Bamfo and Erinda Semanjaku, from IFC; and Alana Davicino, Apoorv Karmakar, Ben Wrobel, and Peixian Liu, from Village Capital. Research support and data analysis was provided by Aaron Mitchell from Maderas Partners.

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# Executive Summary

In the past decade, entrepreneurship has emerged as a powerful tool to address the formidable challenges that limit emerging market economies' ability to grow in a sustainable and inclusive fashion. Entrepreneurs and their startups are able to launch transformative innovations that address development gaps — in areas ranging from food security to extreme poverty — using solutions that are localized, context-appropriate, and scalable.

For entrepreneurs to scale these solutions, they need outside resources. Research shows that financial capital is one of the most critical resources for a growing company: young companies that access outside financing are able to grow up to 30% faster than those that do not.<sup>1</sup> However, it is difficult for entrepreneurs in emerging markets to access that critical capital — in part because of the stark inequality in how investment capital is allocated to founders.

The gender financing gap is a particularly clear example. Female-led startups, or those with at least one female founder, receive a disproportionately small percentage of the flow of global venture capital. Only 11% of seed funding capital in emerging markets goes to companies with a woman on their founding team, and the figures are even lower for later-stage funding,<sup>2</sup> despite the overwhelming evidence that investing in gender-diverse teams leads to stronger business outcomes.<sup>3</sup> This ultimately limits the ability of innovative developmental solutions to grow.

Yet the reasons for this gender financing gap in emerging markets are not well understood, nor are the means by which it can potentially be resolved.

To address this, the International Finance Corporation (IFC), in collaboration with Women Entrepreneurs Finance Initiative (We-Fi), Village Capital and the World Bank Gender Innovation Lab (GIL), set out to evaluate the role that accelerators — organizations that provide capacity-building support to early-stage startups to help them scale their companies and attract investment — can play in addressing the gender financing gap. To determine this, we turned our attention to two primary questions, with a specific focus on startups in emerging markets:

- *What is the gender financing gap pre- and post-acceleration? What factors explain the gap?*
- *What strategies could accelerators employ to address the gender financing gap?*

This snapshot provides an overview of our key insights from the initial research, which has focused primarily on answering the first question, namely understanding the gender gap and the reasons behind it. The findings from this initial research, which we have highlighted below, have led us to develop a series of hypotheses that we will test through experimental accelerator programs over the next year to answer the second question around strategies for accelerators to address the gender gap.

The research informing those hypotheses is based upon a quantitative analysis of a global dataset of more than 2,000 companies collected over a five-year period, supported by the Global Accelerator Learning Initiative (GALI). Using this dataset, we evaluated the commercial performance of male-led startups, or those with all-male founding teams, and female-led startups, or those with at least one female on the founding team, pre-acceleration and post-acceleration.

## FOUR KEY INSIGHTS EMERGED

**1 Acceleration exacerbates the gender financing gap in equity financing.** A key focus of this study was to understand how accelerators are currently impacting the gender financing gap. We found that acceleration widens the gap for equity. We see that male-led startups, on average, increase the amount of equity they raise post-acceleration by 2.6 times as much as female-led startups. This is due to the fact that male-led startups see a significant increase in the amount of equity if they participated in a program, while female-led startups see a similar increase whether they were accelerated or not. These findings suggest that acceleration has little to no effect on the ability of female-led startups to raise equity.

**2 Acceleration removes the financing disadvantage female-led startups face when raising debt.** We found that while acceleration seems to exacerbate the equity financing gap, it actually helps to reduce the disadvantage female-led startups face in raising debt. When comparing startups that participated in an accelerator with those that did not, we see that male-led startups increase the amount of debt they raised post-acceleration or in the calendar year post-application at a similar rate, regardless of whether they participated in a program, while female-led startups that participated in a program increase the amount of debt they raise by nearly 2.5 times as much as female-led startups that did not participate in a program.

**3 The persistent gender financing gap cannot be easily attributed to differences in the quality of the startups, suggesting that investor bias and risk perception may play a role.** It is clear that there is a gender financing gap pre-acceleration, and that acceleration is more effective at addressing the gap for debt than for equity. Statistical analysis shows us that the gap cannot be easily explained by any quantifiable aspect of either startup or founder differences, including founder characteristics, such as education level or experience, and startup characteristics, such as intellectual property, sector of operation, geography, or revenue generated. Building on a growing body of research, this analysis suggests that the gender makeup of the founding team is strongly influencing the disparity in capital raised, suggesting a potential bias in investor decision making or a higher perceived risk for female-led startups.



4

**There are no clear accelerator program design elements that overcome the gender financing gap.**

Through this research, we were interested in identifying specific accelerator traits that are more effective in reducing the gender financing gap. While the most likely traits that might correspond with a smaller gender financing gap — such as having a higher-than-average number of women on a selection committee — are important for gender parity in acceleration, they have little effect on the overall gap. We hypothesize that effective interventions will need to be more holistic, reaching beyond addressing startup behaviors and focusing on influencing the behavior of investors, and that to more effectively address the gender gap, accelerators have a role to play in helping mitigate investors' bias and risk perception.

Through this research, we were able to establish how accelerators are currently impacting the gender financing gap. We see that acceleration seems to have an outsized impact on the ability of male-led startups to raise equity, thereby increasing the equity gap, and an outsized impact on the ability of female-led startups to raise debt, thereby reducing the disadvantage female-led startups face when raising debt.

There is a clear need for new strategies to address the gender financing gap. As a next step, we have developed a series of hypotheses to test and

explore throughout accelerator programs over the next year, and encourage other interested accelerators and investors to do the same. Once we have implemented the experimental programs and completed an analysis of the results, we will release a toolkit for accelerators and investors outlining concrete actions they can take to close the gender financing gap.

Addressing the gender financing gap will require going beyond the status quo: we need to innovate in our approach to make real progress toward gender parity in entrepreneurship.



**Acceleration seems to have an outsized impact on the ability of male-led startups to raise equity, and the ability of female-led startups to raise debt.**

# Introduction

One of the bright spots in the push to achieve the United Nations' Sustainable Development Goals has been the emergent role of entrepreneurs using technology to launch transformative innovations that address development gaps and development goals, in areas ranging from food security to poverty alleviation. Advances in communications technology, expanding mobile phone ownership and other trends have helped small companies scale at unprecedented rates.

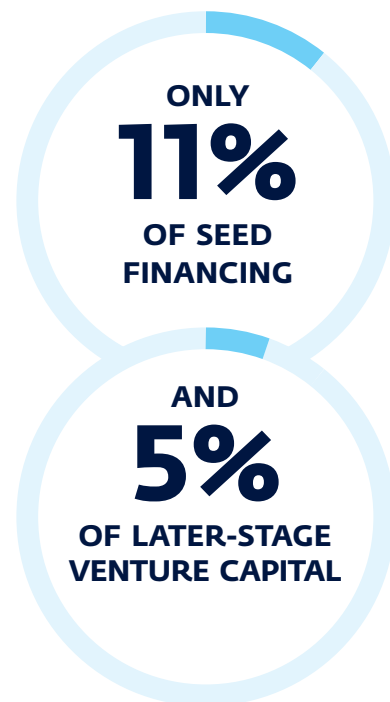
Startups can offer solutions that are localized, contextualized, and scalable. In Nigeria, for example, female-founded personal savings and investment platform PiggyVest, launched in 2016, now has more than 350,000 users saving over \$2.7 million in total across the country every month.<sup>4</sup> Similarly, Loans4SME, an Indian-based female-led platform for small businesses to raise debt capital, has contributed a total of \$35 million of working capital to more than 70 businesses since its founding in 2016.<sup>5</sup>

Growing and sustaining these innovative solutions requires outside resources, of which early-stage venture capital is one of the most important as a risk-tolerant source of funding. Companies that access external funding — whether from family and friends, angel investors, venture funds, private equity funds, philanthropic foundations, corporate actors, or government agencies — are able to grow up to one third faster than those that do not.<sup>6</sup> A study of young firms participating in accelerators found that two years after raising

capital, funded companies achieved 30% more growth in revenue and 50% more growth in employment than companies that did not raise funding — an unsurprising statistic given the boost that capital can give startups to increase their revenues, create new jobs, and scale their businesses.<sup>7</sup> The presence of capital providers can also play a broader ecosystem-level role that supports entrepreneurship, including signaling effects and role model effects in the community.<sup>8</sup>

Given the urgency of the challenges facing emerging markets, the scale and speed of effective solutions is crucial, making the need for early-stage capital all the more acute for founders in those markets with great ideas.

**In 2018, startups in emerging markets with a woman on their founding team received**



*Yet the way that critical capital is deployed is remarkably unequal.*

There is a clear and noticeable distortion in how venture capital is distributed among both places and people. Startups in emerging markets raise only a fraction of the capital raised by those in developed markets — in 2018, emerging-market economies accounted for just 18% of equity and venture capital raised.<sup>9</sup> More remarkably, startups with a woman on their founding or leadership team received only 11% of seed financing and only 5% of later-stage venture capital in emerging markets.<sup>10</sup> This is despite the fact that several recent studies have shown a strong business case for investing in startups with diverse leadership teams — in the form of stronger performance and better returns on equity.<sup>11 12 13</sup>

**In 2018, emerging-market economies accounted for just**

**18%**



**of equity and venture capital raised**

This gender financing gap for early-stage, high-growth startups — which are the focus of this report — is a persistent and well-documented global problem. However, the causes of that gap are still poorly understood, and while there has been a proliferation of new interventions over the past decade aimed at addressing the gap, progress towards a more equitable gender balance in venture funding has been limited.

*Why and how can we make more notable progress toward addressing it?*

To help answer these questions, we can turn to accelerators — organizations that support entrepreneurs and connect them with the social, financial, and human capital they need to scale.<sup>14</sup> In the past decade, hundreds of accelerators, incubators and other “entrepreneur support organizations” have been launched around the world, many with an explicit focus on inclusive entrepreneurship or social impact.<sup>15</sup> Although there have been studies evaluating the effectiveness of acceleration in general, less is known about the role of acceleration in the fundraising process for female-led startups.<sup>16</sup>

IFC, in collaboration with We-Fi, Village Capital and the World Bank GIL, set out to learn what the gender financing gap looks like for startups pre- and post-acceleration and what factors may cause that gap, and to identify strategies that accelerators can employ to address it.

The following snapshot provides an overview of the key findings from our initial research, conducted from May to December 2019, which focused on qualitative and quantitative analysis of business performance data from more than 2,000 startups that applied to accelerators.

We will incorporate insights from the research in experimental accelerator programs to test strategies that accelerators can employ to more effectively reduce the gap, and synthesize these findings in an action-oriented, publicly available toolkit for accelerators, investors, and other intermediaries.

# Research Methodology

What follows in the next section are some of the key insights we gleaned from a review of more than 2,000 startups over five years, supported by data collected by GALI, a partnership between ANDE and Emory University designed to study the effectiveness of accelerators on entrepreneurship.

## GALI DATA OVERVIEW

Since 2013, GALI has partnered with impact-oriented accelerators and other entrepreneur support programs to collect detailed data from more than 19,000 applicants and 3,100 participants to 280 accelerator programs. GALI surveys startups when they first apply to participate in an accelerator program, and then each calendar year following the program, regardless of whether or not they participated in the accelerator, to evaluate the performance of the startups over time. GALI provides a publicly available version of the anonymized dataset.<sup>17</sup>

## RESEARCH DATASET

**Startup Data:** The data in this research snapshot represents a subset of data collected by GALI from startups that applied to accelerator programs between 2013 and 2018, and includes both application data (if did not participate, “application;” if participated, “pre-acceleration”) and data collected in the next calendar year (if did not participate, “Calendar Year [CY] post-application;” if participated,

“post-acceleration”). We evaluated a sample of 2,157 startups,<sup>18</sup> which included both startups that participated in an accelerator program (“participants”) and those that, for various reasons, applied to a program but did not participate in one (“non-participants”).<sup>19</sup> We limited the sample to those startups that completed the post-acceleration survey,<sup>20</sup> identified as for-profit companies, and provided gender data for their founding teams. This sample allowed us to compare, by gender composition of the founding team, companies’ performance at the time they applied to an accelerator to their performance post-acceleration (for participants) and in CY post-application (for non-participants).

**To understand the gender financing gap, we divided the data into two categories of startups:**

1. Startups with no female founders, referred to in this research snapshot as “male-led startups.”
2. Startups with at least one female founder of a maximum of three co-founders, referred to as “female-led startups.”<sup>21</sup>

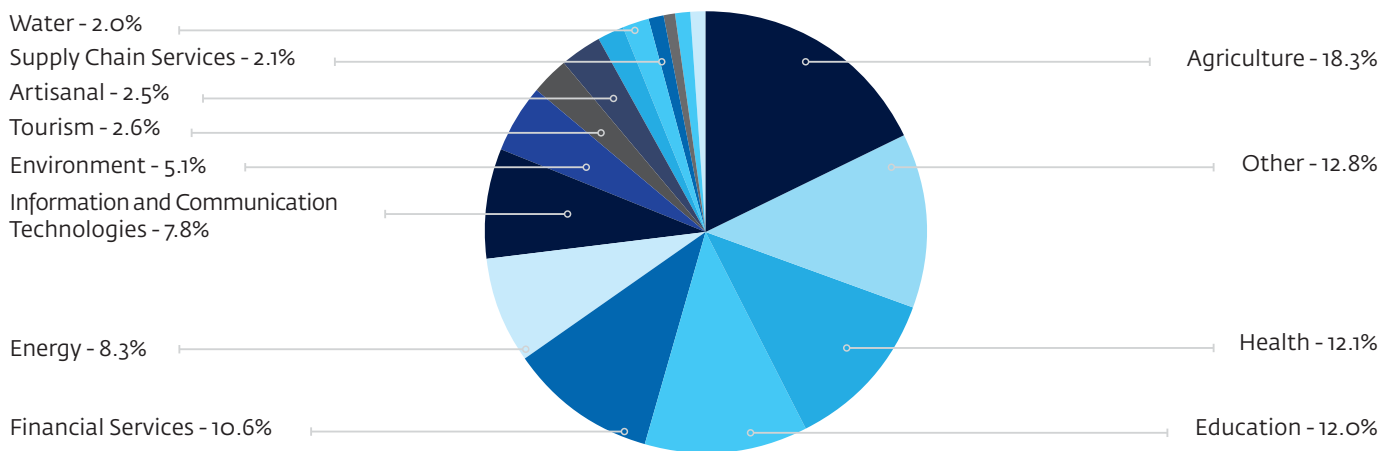
The startups in the dataset represent a wide geographic range, with 34% hailing from sub-Saharan Africa, 29% from Latin America and the Caribbean, 23% from North America, 8% from South Asia, and the remaining 6% from across Europe, the Middle East and North Africa, other regions of Asia, and the Pacific. The most frequently reported sectors included agriculture (18%), education (12%), health (12%), financial services (10.5%), and information and communication technologies (7.8%).

Further, the startups in the dataset are early stage, generally at either the pre-seed or seed stage. Roughly 46% of the startups in the dataset were pre-revenue and 77% had not

yet raised any formal financing at the time they applied to an accelerator program.

**Accelerator Program Data:** In addition to evaluating the data at the startup level, we also evaluated specific characteristics of the accelerator programs to determine which factors, if any, were correlated with a reduced gender financing gap. This analysis was at the program level and comprised a sample size of 83 accelerator programs, which could include multiple programs for one accelerator organization. We limited the dataset to those programs that provided programmatic data, had at least two female-led and two male-led startups in the cohort, and supported for-profit startups.

**FIGURE 1: Startups in the Dataset by Sector**



*Housing Development, Culture, Infrastructure, and Technical Assistance all represent 1% or less.*

## VARIABLES

**Startup Data:** We primarily focused on commercial performance indicators when evaluating the gender financing gap, which included: equity financing and debt capital raised,<sup>22</sup> including a combined variable for both equity and debt; philanthropic capital raised; revenue generated; and growth in equity financing, debt capital, and revenue at CY

post-application and post-acceleration, calculated by subtracting the amount of each at application or pre-acceleration from the amount of each at CY post-application and post-acceleration. We also evaluated startup characteristics, such as sector, geography, and intellectual property, among others, and founder characteristics, such as education and experience.

**Accelerator Program Data:** We evaluated program characteristics that we thought would be most closely correlated with the gender financing gap, such as whether the program has a stated preference for supporting female-led startups, the gender makeup of the selection committee, the overall length of the program, and programmatic structure.

## ANALYSIS

**Startup Data:** In evaluating the startup data, we first truncated each of the commercial performance variables (capital raised and revenue generated) down to the 99th percentile of the entire sample dataset to ensure outliers were not skewing the findings. This ensured that we did not eliminate outliers since success in venture capital is often captured by the outliers, but we dropped the value of the outliers to the 99th percentile value to keep the high performance in the dataset while building a dataset that could be analyzed.

The analysis relied on a series of t-tests and linear ordinary least squares (OLS) regressions. The t-tests primarily focused on the relationship between gender and specific commercial performance variables and startup characteristics, evaluating the statistical significance in any notable differences between male-led and female-led startups. The linear regressions similarly focused on the relationship between gender and specific commercial performance variables, while controlling for various startup characteristics, such as sector

and geography, and commercial performance variables pre-acceleration, evaluating statistical significance for each. The primary dependent variables we analyzed were revenue, equity, debt, and philanthropic capital post-acceleration and at CY post-application, considering the independent variables of gender, participation in an accelerator, sector, geography, and revenue, equity, debt, and philanthropic capital pre-acceleration.

We primarily evaluated statistical significance up to the 90th percentile. However, due to the sample size, we included significance up to the 80th percentile in a few cases, and have noted which ones in the key insights that follow.

**Accelerator Program Data:** For the program-level data, we first identified program-level variables that could logically correspond with how female-led startups fare in a program, including representation of women on selection committees and in mentor pools, as well as program design choices such as duration and whether the program had a structured curriculum. We then calculated, within each cohort, the gender gap (average equity and debt growth experienced by male-led startups minus that experienced by female-led startups), and ran t-tests to determine whether these program-level variables corresponded with consistently larger or smaller gender gaps (at the cohort level), noting those that were significant at at least the 90th percentile.

## Key Insight 1:

### Acceleration exacerbates the gender financing gap in equity financing.

A key component of this study was to understand how accelerators are currently impacting the gender financing gap, where we see that female-led startups in emerging markets receive only 11% of seed funding.<sup>23</sup> To answer this central question, we compared the gender financing gap for equity at application and pre-acceleration to the gap post-acceleration and at CY post-application.

We found that acceleration widens the gender financing gap for equity. When comparing this to the group of startups that did not participate in an accelerator, we see that the increase in the gap is less extreme. This is due to the fact that male-led startups see a significant increase in the amount of equity if they participated in a program, while female-led startups see a similar increase whether they were accelerated or not, suggesting that acceleration has little to no effect on the ability of female-led startups to raise equity. We explore some of the potential underlying reasons for the gap and corresponding increase in Insight 3.

To understand the impact of acceleration on the gender financing gap, we first evaluated the gap pre-acceleration and at application and then compared that to the gap post-acceleration and at CY post-application. We initially compared the differences in the average commercial performance of female-led and male-led startups that completed an accelerator and those that did not through a series of t-tests. We then conducted a series of linear regressions comparing the same factors, controlling for variables that may influence differences in commercial performance, such as sector, geography, and commercial performance pre-acceleration.

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## THE GENDER FINANCING GAP PRE-ACCELERATION

We found that the gap is readily apparent when startups apply to an accelerator: male-led startups already have nearly twice as much equity at application compared to female-led startups. This is true despite the fact that the percentage of female-led startups that have raised equity was only slightly lower than that of male-led startups with equity raised at

the time they apply to an accelerator (17% and 20%, respectively), indicating that when female-led startups raise equity, they do so in smaller amounts. Despite these differences at the time startups apply to accelerators, male-led and female-led startups are selected to participate in accelerators at similar rates.

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## THE GENDER FINANCING GAP IN THE CY POST-APPLICATION

We also found that the impact of raising less equity capital initially may compound over time: the amount of equity raised at application is highly correlated with the amount of equity raised in the CY post-application. For every dollar of equity raised at application, startups raise an additional 77¢ in equity the next calendar year post-application on average.<sup>24</sup>

Further, see that the gap increases even when taking the compounding impact of having less capital initially into consideration. In other words, regardless of how much equity they had initially, female-led startups are at a

significant disadvantage by having a woman on their founding team: female-led startups raise, on average, \$15,000 less equity than male-led startups in the CY post-application, even when controlling for sector, geography, and commercial performance at application.<sup>25</sup>

We further broke this down to understand the differences in the gap for those that participated in an accelerator and those that did not. We expected to see that acceleration would narrow the gap, even if only slightly. However, we found the opposite: the gap seems to widen even further for participants.



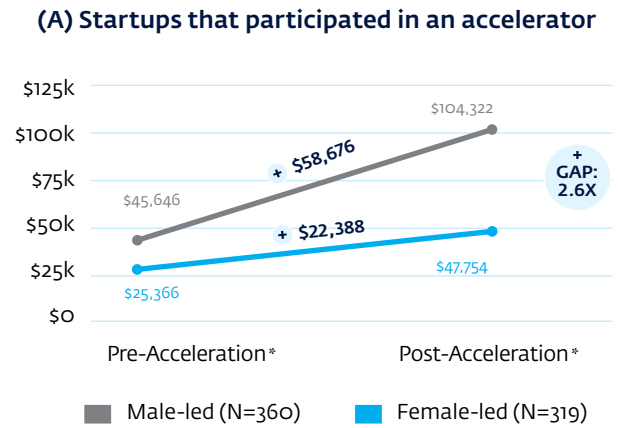
### Accelerator Participants: Pre- and Post-Acceleration Performance

Male-led startups that participated in an accelerator see, on average, an increase of \$58,000 in equity financing raised, while their female-led counterparts experience an increase of only \$22,000. Put another way, acceleration increases the amount of equity male-led startups raise 2.6 times more than female-led startups.

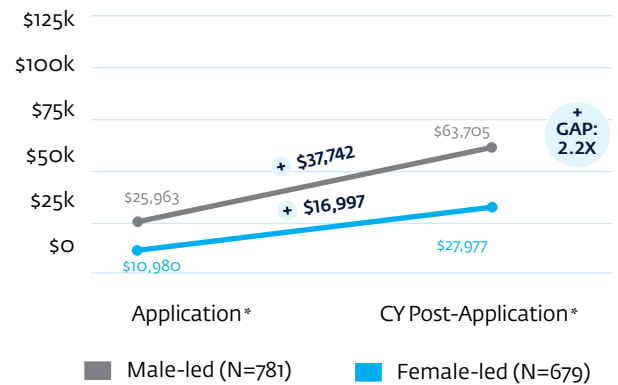
### Accelerator Non-Participants: Performance at Application and CY Post-Application

We compared this to the group of startups that applied to but ultimately did not participate in an accelerator. For these startups, the increase in the amount of equity financing male-led teams received compared to female-led startups over the same period was roughly 2.2 times higher: male-led teams still raise more equity, but the difference is less extreme. This indicates that the gender financing gap is wider for participants than for non-participants.

**FIGURE 2: Average Equity Raised**

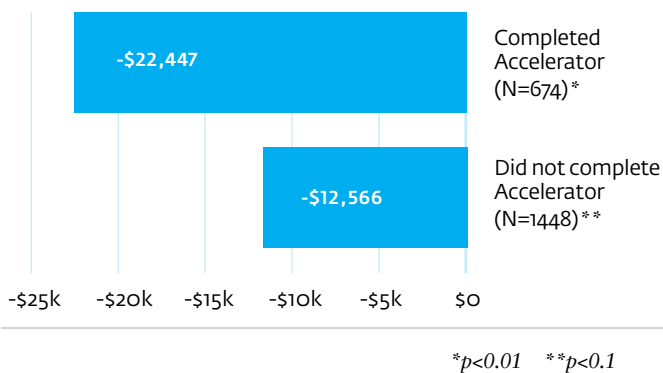


**(B) Startups that did not participate in an accelerator**



\*p<0.01

**FIGURE 3: Difference in Equity Raised for Female-Led Startups Compared to Male-Led Counterparts**



This holds true even when we controlled for sector, geography, and commercial performance pre-acceleration through a linear regression. Female-led startups that participated in an accelerator fare much worse, raising, on average, \$22,000 less equity than their male-led counterparts, compared to \$12,500 less for female-led startups that did not participate in an accelerator — nearly a 2x difference.

It is important to note that this does not necessarily mean that female-led participants raise less equity than female-led non-participants post-acceleration. Rather, the increase in the gap is because male-led startups saw a greater increase if they participated in an accelerator. Male-led participants saw about a 1.5x increase in equity if they participated in an accelerator, whereas female-led startups saw a similar increase regardless of participation.

These findings illustrate that not only is there a gender financing gap in equity pre-acceleration, but that the gap increased for those that participated in an accelerator. The findings further suggest that acceleration has a greater impact on the ability of male-led startups to raise equity and little-to-no impact on female-led startups. We explore some of the potential underlying reasons for the gap and corresponding increase in Insight 3.

**Not only is there a gender financing gap in equity pre-acceleration, but that gap increased for those that participated in an accelerator.**



## Key Insight 2:

Acceleration removes the financing disadvantage female-led startups face when raising debt.

To understand the impact of acceleration on the gender financing gap, we further evaluated the disadvantage that female-led startups face in raising debt compared to male-led startups pre- and post-acceleration, and compared that to the gap we saw in equity financing.

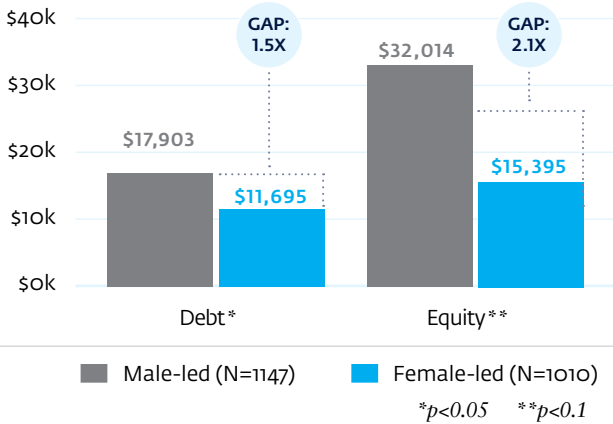
We found that while acceleration seems to exacerbate the equity financing gap, it actually helps remove the disadvantage that female-led startups face when raising debt. Female-led startups raised significantly more debt if they participated in a program, while male-led startups raised about the same amount whether they were accelerated or not. The effect is that while acceleration does not decrease the gender financing gap for debt, unlike with equity, it generally prevents the gap from increasing. We explore why this may be in Insight 3.

Similar to our analysis of the equity financing gap, to understand the debt financing gap, we compared the debt gap pre- and post-acceleration. Using similar statistical techniques, we first compared the average debt performance of female-led and male-led startups that completed an accelerator with that of those that did not, through a series of t-tests. We then conducted a series of linear regressions comparing those same factors, controlling for variables that may influence differences in commercial performance, such as sector, geography, and commercial performance pre-acceleration.

### THE GENDER FINANCING GAP FOR DEBT PRE-ACCELERATION

We found that the debt gap between male-led and female-led startups is actually narrower than the equity financing gap before startups even participate in an accelerator. When startups apply to an accelerator program, male-led startups have, on average, \$17,000 in debt financing, while female-led startups have, on average, around \$11,000, making the gap about 1.5x for debt compared to 2.1x for equity.

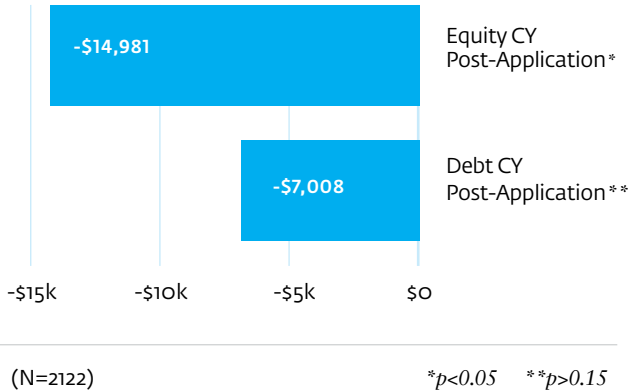
**FIGURE 4: Gender Financing Gap Pre-Acceleration - All Applicants**



### THE GENDER FINANCING GAP FOR DEBT POST-ACCELERATION

Notably, when controlling for sector, geography, and commercial performance differentials pre-acceleration, we see that female-led startups face less of a disadvantage when raising debt post-acceleration than when raising equity, regardless of their participation in an accelerator. Female-led startups, on average, raise only \$7,000 less debt — compared to \$15,000 less equity — than their male-led counterparts.

**FIGURE 5: Difference in Capital Raised for Female-Led Startups Compared to Male-Led Counterparts by Equity and Debt**



### Comparing Startups that Participated in an Accelerator to Startups that did not

Acceleration also seems to have a positive impact on the ability of female-led startups to raise debt capital, whereas it has little-to-no impact on male-led startups' ability to raise debt. Female-led startups see a significant increase in the amount of debt if they participated in a program, 2.5 times as much as female-led startups that did not, while male-led startups see a similar increase whether they participated or not.

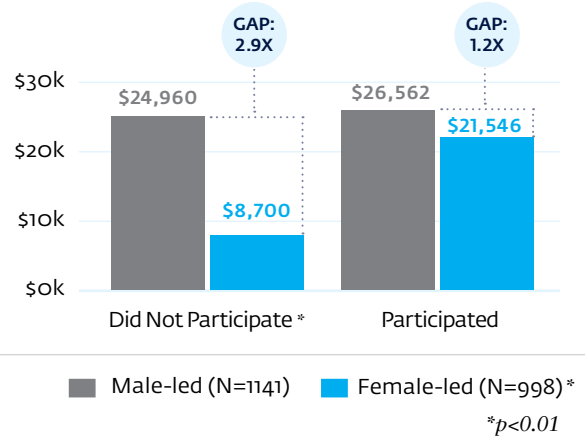
While acceleration does not narrow the gender financing gap for debt, unlike with equity, it generally prevents the gap from increasing. Conversely, we see a significant increase in the debt gap for non-participants: the gap increases roughly 4.8x for startups that did not participate versus a slight increase of 1.5x for those that participated.

This is even more notable considering the amount of debt raised pre-acceleration is highly correlated with the amount of debt raised post-acceleration: for every \$1 of debt raised pre-acceleration, startups raise an additional 68¢ of debt post-acceleration, on average.<sup>26</sup> The finding indicates that acceleration limits the compounding disadvantage that female-led startups face when having less capital initially.

This effect holds even when we control for sector, geography, and commercial performance pre-acceleration through a linear regression. We see that female-led startups that did not participate in an accelerator raise, on average, \$11,000 less in debt than male-led startups, but female-led participants do not see a disadvantage in raising debt compared to their male-led counterparts.<sup>27</sup>

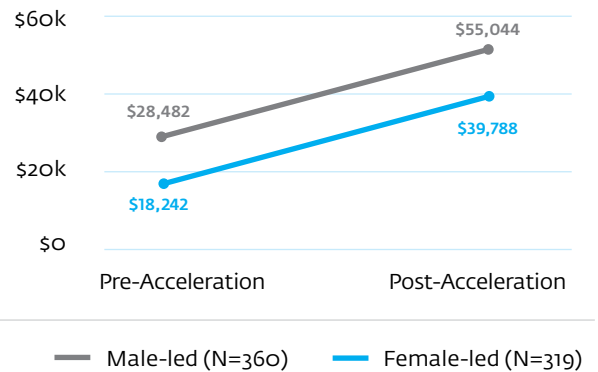
These findings demonstrate that acceleration has an outsized impact on the ability of female-led startups to raise debt, and in doing so, helps remove the disadvantage they face for having a female founder. We explore why this may be in Insight 3.

**FIGURE 6: Increase in Debt Raised CY Post-Application**

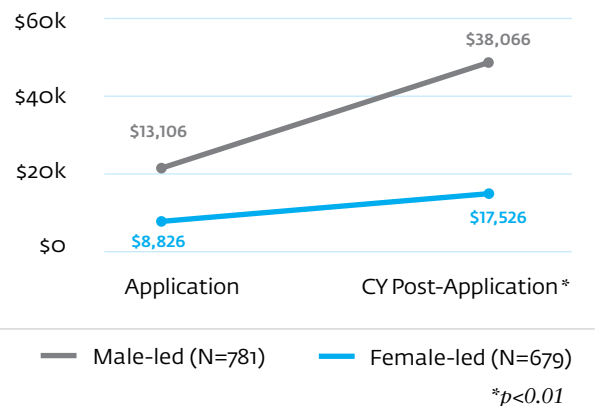


**FIGURE 7: Average Debt Raised**

**(A) Startups that participated in an accelerator**



**(B) Startups that did not participate in an accelerator**



## Key Insight 3:

The persistent gender financing gap cannot be easily attributed to differences in the quality of the startups, suggesting that investor bias and risk perception may play a role.

To determine what might explain the gender financing gap, and the differential impact of acceleration on the gap for debt and equity financing, we evaluated several factors that may contribute to the gap.

We found that the gender financing gap cannot be easily explained by any quantifiable aspect of either startup or founder differences, such as education level or experience of the founder, or intellectual property, sector, or geography of the startup. Building on a growing body of evidence, this analysis suggests that gender plays a role in this capital disparity, including the potential for bias in investor decision making or higher perceived risk for female-led startups. The analysis further suggests that there may be a positive correlation between risk and the disadvantage female-led startups face: as risk is reduced, so is the opportunity for investor bias. The extent to which investor bias and higher perceptions of risk play a role warrant further exploration.

To better understand what might explain the gender financing gap, we evaluated several variables that might account for — or at least contribute to — the gap. If we found any differences between female-led and male-led startups, we then tested whether those differences correlated to the gap, using both t-tests and linear regressions, as discussed below.

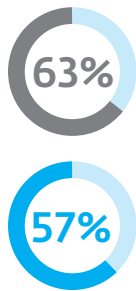
## STARTUP AND FOUNDER CHARACTERISTICS

We identified startup and founder characteristics that might reasonably explain the financing disparity, and evaluated whether there were any key differences in these characteristics, including:

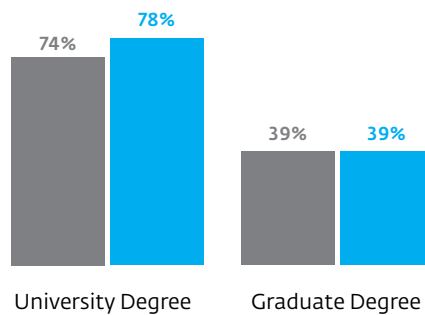
- Founder Characteristics: Education, previous founding experience, and age;
- Startup Characteristics: Intellectual property, target margins, commercial objectives, fundraising targets for next 12 months, sector of operation, and geography.<sup>28</sup>

**FIGURE 8: Founder Characteristics**

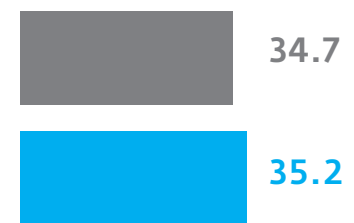
(A) Prior Founder Experience



(B) Higher Education



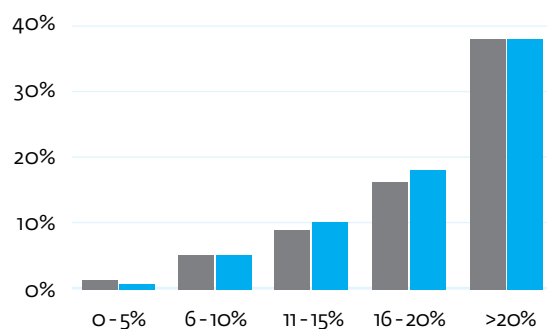
(C) Average Founder Age



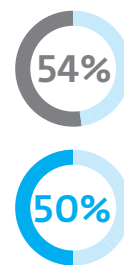
*Across most of the factors we evaluated we did not find any notable differences that could explain the difference or warrant further analysis through more sophisticated statistical techniques.<sup>29</sup>*

**FIGURE 9: Startup Characteristics**

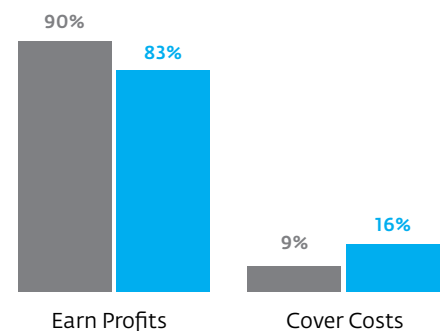
(A) Target Margins



(B) Companies with Intellectual Property



(C) Commercial Objectives



■ Male-led (N=1147)    ■ Female-led (N=1010)

There are a few notable exceptions: fundraising targets, sector, and geography.

### Fundraising Targets

When evaluating the one-year fundraising targets that male-led and female-led startups reported when they applied to accelerator programs, we see that male-led startups, on average, target to raise 63% more equity than female-led startups and 50% more debt. However, on average, both male-led and female-led startups raise only a small fraction of their overall targets, around 0.5% and 8%, respectively, indicating that the correlation may not be very strong. Further, linear regressions illustrate that the fundraising targets have a very limited effect on the actual amount raised post-acceleration, indicating that the targets are likely inconsequential. Although it is plausible that

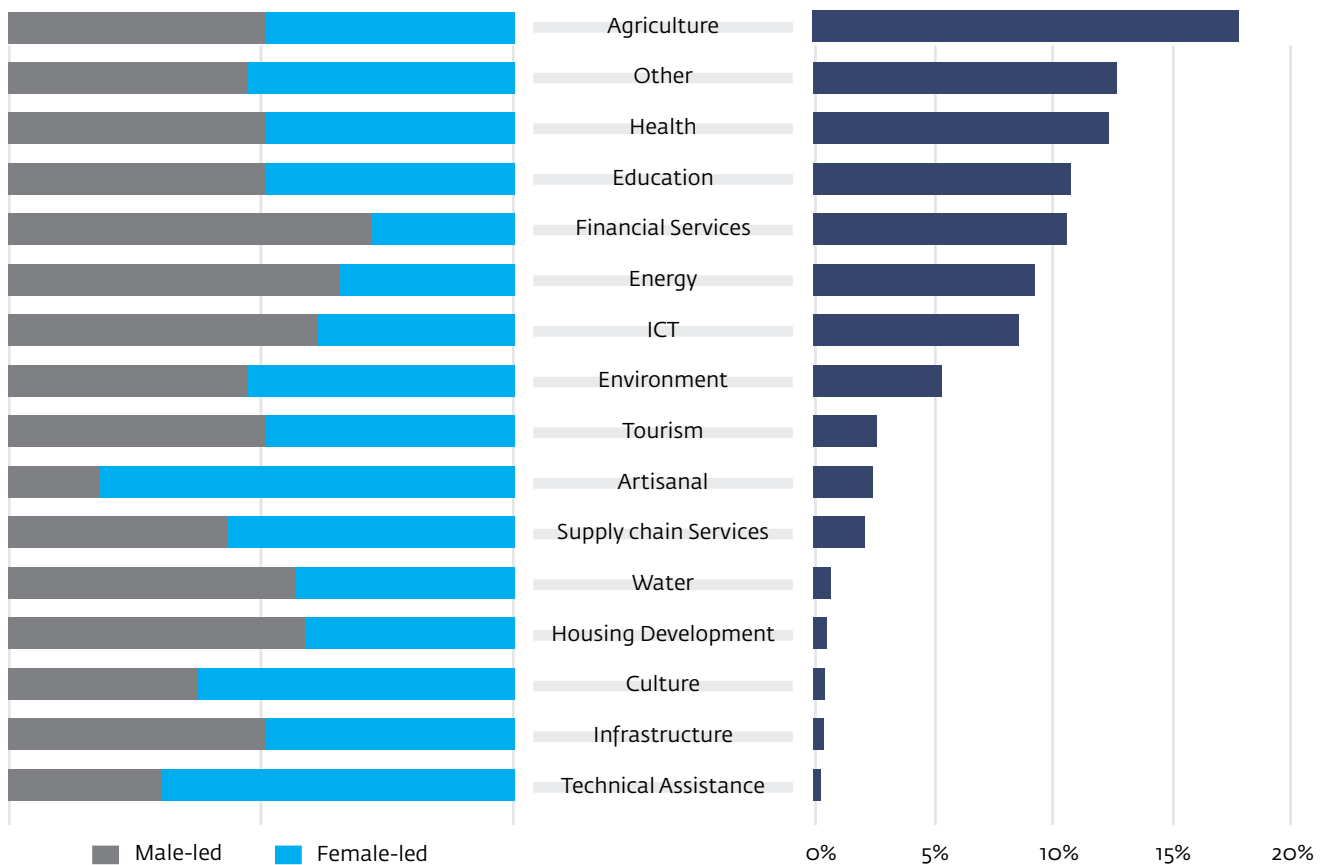
fundraising targets do not necessarily indicate the amount startups are seeking when meeting with prospective investors, this analysis indicates that fundraising targets have little, if any, impact on the overall gender financing gap.

### Sector and Geography

We also saw variability in the percentage of female-led versus male-led startups within sectors and geographies.

There is a higher percentage of female-led startups than of their male-led counterparts within traditionally less capital-intensive sectors, like artisanal and culture. Similarly, there is a higher percentage of male-led startups than of their female-led counterparts within traditionally high-growth tech sectors, like financial services and ICT.

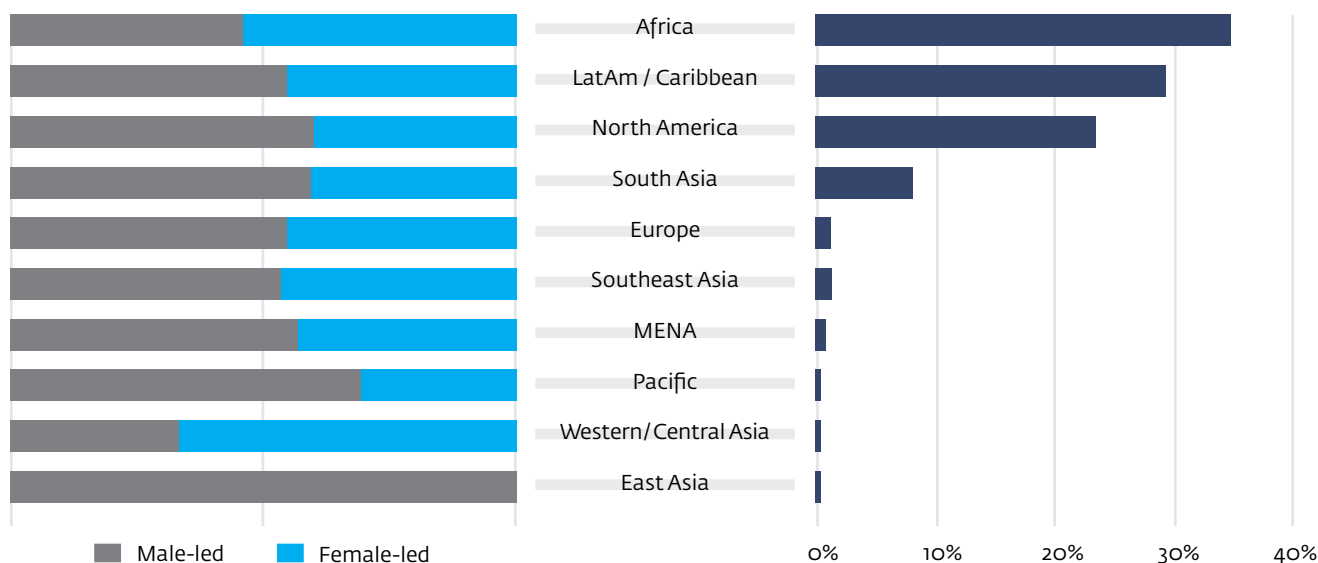
**FIGURE 10: Sector Breakdown by (A) Gender and (B) Percent of Companies in Each Sector**





With regard to geography, there are a higher percentage of male-led startups than of their female-led counterparts in regions that tend to receive higher rates of investment capital, such North America and Europe.

**FIGURE 11: Region Breakdown by (A) Gender and (B) Percent of Companies in Each Region**



Due to these differences, we controlled both sector and geography through linear regressions to better account for the influence of these differences on the gender financing gap. The results of the regression indicated that even when taking these differences into account, we still found a significant gender financing gap as described in the previous two insights.

### *Commercial Performance Pre-Acceleration*

Another factor that could potentially contribute to the post-acceleration gender gap is the commercial performance differences between female-led and male-led startups pre-accelerator, including differences in the amount of equity, debt, and philanthropic capital raised, and revenue generated. To account for these differences, we controlled for the impact of commercial performance at the time startups

applied to an accelerator program through linear regressions. We also accounted for gender financing disparity at time of application in t-tests, by evaluating how much additional capital startups raised pre- and post-acceleration (the “increase” in capital raised). In both cases, we still saw a significant gender financing gap post-acceleration, as described in the previous two insights.

### *Revenue Performance Effect of Investment*

We also wanted to explore whether there were any notable differences in the overall effect of an investment on subsequent performance of a startup — in other words, what impact does the investment have on business growth or sustainability in a male-led startup versus in a female-led startup?

Through linear regressions, we evaluated the correlation between the amount of investment startups raise pre-acceleration and the revenue generated post-acceleration, controlling for sector, geography, and other commercial performance variables.

We found that for every dollar of equity investment female-led companies had pre-acceleration, they saw about 40¢ of revenue generated post-acceleration.<sup>30</sup> Notably, we did not find any correlation among these variables for male-led startups.

Further, we saw that female-led startups generate twice as much revenue per dollar of debt investments than their male-led counterparts. For every dollar of debt raised pre-acceleration, female-led startups raise \$1.12 of revenue post-acceleration,<sup>31</sup> compared to 54¢ for male-led startups.<sup>32</sup>

Rather than explaining the disparity, the increased revenue performance of female-led startups versus male-led startups leads to more questions around how gender plays a role in the investor decision making process, discussed in the next section.

for every \$1 of pre-acceleration equity investment, **females saw \$.40 of revenue post-acceleration, with no correlation among males.**



for every dollar of debt raised **female-led startups raised \$1.12 of revenue post-acceleration, while male-led startups raised \$.54**

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## THE ROLE OF INVESTOR BIAS IN THE GENDER FINANCING GAP

If the gender financing gap cannot be clearly attributed to observable differences in the startups, what is contributing to this fundraising disparity? Why does the gap for equity increase post-acceleration? And why do we see such a difference for debt?

The data suggest that acceleration has an outsized impact on the ability of male-led startups to raise equity, widening the gender gap for equity, and an outsized impact on female-led startups' ability to raise debt, effectively removing the disadvantage

that female-led startups face in raising debt compared to their male-led counterparts.

Clearly understanding the cause of these disparities requires further testing and exploration. However, given the lack of immediately visible alternative explanations related to business, market or founder traits, we hypothesize that the gender makeup of the founding team, including the potential for investor bias and perception of risk when the company is female-led, play a role.

## Equity

When evaluating an investment opportunity, equity investors receive a predetermined ownership share of the company for the amount of capital they invested. As a result, they evaluate the potential of a startup to grow at a rate such that they can sell their share in the startup for many multiples greater than their initial investment (usually ten times the original investment).<sup>33</sup> This often requires that early-stage equity investors consider, among other things, the size of the market and the potential for the startup to scale quickly into that market to trigger a liquidity event and return of capital. Since early-stage startups often have little demonstrated traction, equity investors often must rely heavily on the vision and potential of the founding team to capture a sizable share of the market.<sup>34 35</sup> It also requires a level of confidence that the startup will be able to secure later rounds of financing to help support an exponential rate of growth.

Although there is no explanation for the gender financing gap in the quantifiable aspects of the startups that we evaluated, one potential explanation is that female-led startups may be seeking equity less often than their male-led counterparts, if, for example, they have a desire to maintain greater ownership in their company. However, our analysis found that similar percentages of male-led and female-led startups raised equity capital (21% and 17%, respectively) post-acceleration. Further, when isolating startups that have raised equity post-acceleration, male-led startups that participated in an accelerator raised three times more equity than their female-led counterparts (and 2.4 times for those that did not participate in an accelerator). This demonstrates that female-led startups seem to be seeking equity at similar rates and that the gender financing gap

remains for those that are actually raising equity, and therefore presumably comfortable with diluting ownership in their startup.

Another possible explanation is that investors may perceive that exogenous factors outside their control will limit the growth of startups with female founders, and therefore limit their return on investment. This could be the case, for example, if female-led startups are likely to face more discrimination in the market, impacting their ability to acquire customers, obtain regulatory approvals, and secure later rounds of financing, all of which are factors that could be at play in various markets. For example, a 2018 survey of nearly 300 female entrepreneurs found that nearly 50% reported experiencing discriminatory behavior from vendors or suppliers, and in some cases, that potential partners or clients showed a gender bias in their interactions.<sup>36</sup> It might, therefore, seem reasonable for investors, consciously or not, to perceive that female-led startups might be less successful in the market and consequently factor this perception into their investment decisions.

Yet, despite the potential perception that women may fare worse in the market, our findings demonstrate that female-led startups generate more revenue per dollar of investment, indicating that market discrimination is not limiting their performance compared to their male-led counterparts. A number of other studies have found similar evidence that female-led companies outperform male-led ones in terms of revenue. For example, one study found that female-led startups generated 78¢ of revenue for every dollar of funding, while male-led startups

generated just 31¢,<sup>37</sup> suggesting that the gender financing gap is the result of more than the perception of market discrimination.

Overall, these findings indicate that investor bias may contribute to the gap. In fact, there is a growing body of evidence indicating that bias influences how investors evaluate startups. For example, one study found that investors ask female entrepreneurs more risk-focused questions, while investors ask their male counterparts more questions about their companies' potential when pitched the exact same business.<sup>38</sup> Another study found that the same video pitch for a startup was twice as likely to get funded by investors when narrated by a male voice than by a female one.<sup>39</sup>

### *Debt*

What about the difference in debt? The gender financing gap for debt may be less than for equity pre-acceleration because debt is a less risky financing option, and one where the gender makeup of the founding team may have less of an impact on how the startup is evaluated.

Although overall, the amount of debt startups raise is generally less than the amount of equity — for example, male-led and female-led startups that participate in an accelerator raise, on average, 47% and 17% less debt than equity,<sup>40</sup> respectively — debt is a lower-risk investment structure for investors than equity.

Debt investors evaluate whether to invest in a business based on the ability of that business to repay the investment within a predetermined time frame and at a predetermined interest rate. When assessing the risk of a business, debt

investors will, among other things, look at a business' cash flow, financial model, traction, and collateral.<sup>41</sup> By contrast, equity investors need a liquidity event, such as an acquisition or initial public offering, to see a return of capital, a much riskier proposition.<sup>42</sup>

Acceleration may further reduce the perception of risk for female-led startups for debt investments. Accelerators often focus on helping startups gain access to networks of investors and refine their business models, financials, and customer value proposition.<sup>43</sup> Because debt investors rely heavily on the financials of a business, the support accelerators provide can help derisk the investment and reduce the investors' reliance on evaluating the team, which may be more subject to bias. However, business model support and access to networks, although important, support does not seem to notably impact the perception of risk for equity investors, which rely much more on the potential for the startup and founding team to capture a sizable share of the market, and trigger a liquidity event to return capital.

Overall, this analysis suggests that both investor bias and perception of risk play a role in the gender financing gap. How and to what extent the gender makeup of the founding team contributes to this gap warrants further explanation. We plan to further test our hypothesis, and strategies to overcome the gender financing gap, in the next phase of this research.

## Key Insight 4:

There are no clear accelerator program design elements that overcome the gender financing gap.

In conducting this research, we were interested in exploring specific accelerator traits that could correspond with a reduction in the gender financing gap.

While the traits most likely to correspond with a smaller gender financing gap — such as having a higher-than-average number of women on a selection committee and in mentor pools — are important for gender parity in acceleration, they have little effect on the overall gap. This suggests that accelerators need to do more to identify strategies to reduce the gender financing gap. We hypothesize that accelerators have a role to play in reaching beyond addressing startup behaviors, to influencing the behavior of investors, helping mitigate investors' bias and risk perception.

To evaluate strategies that accelerators could employ to reduce the gender financing gap, we identified program design variables that could logically correspond with how female-led startups fare in a program, such as gender makeup of the selection committee and length of program. We then calculated, within each cohort, the gender financing gap for both debt and equity post-acceleration, and ran t-tests to determine whether these program design variables corresponded with consistently larger or smaller gender gaps at the cohort level.

## PROGRAM DESIGN ELEMENTS AND THE GENDER GAP

For the most part, we did not find any variables that were a clear solution to address the gender gap, with a couple of minor exceptions that warrant further investigation.

**TABLE 1: Program Design Variables' Correlation to Gender Gap**

Program Variable	Equity Financing Gap Post-Program	Debt Financing Gap Post-Program
Selection (women selectors, stated preference for women)	No significance	No significance
Program Structure (duration, structured curriculum, women mentors)	No significance	Longer program duration*
Program Investment (program makes direct investments)	No significance	No significance

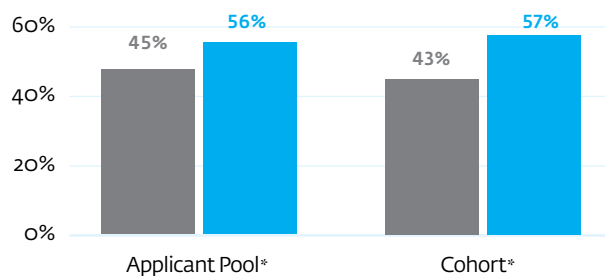
\*Significant at the  $p < .10$  level

### Selection

We found that a higher percentage of women on the selection committee does correspond with significantly more female-led startups in accelerator applicant pools and cohorts.<sup>44</sup>

However, while representation of women on a selection committee correlates with greater gender parity, it does not necessarily coincide with a smaller gender financing gap.

**FIGURE 12: Percentage of Companies with Women on Founding Team (avg across programs)**



■ Less than 45% women selectors (N=77)

■ At least 45% women selectors (N=110)

\* $p < 0.01$

## Program Structure

There was only one minor program strategy that seemed to correlate with reducing the gender financing gap, though the correlation overall is relatively minor. The data suggest that program duration may play a role, as the debt financing gap is smaller for in-person programs that are longer than 80 days in person (the median program duration). Although the reasons for this have not been explored, we can hypothesize that longer programs help startups further refine their business models, which may further derisk the startup for debt investment (as described in Insight 3).

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## THE ROLE OF ACCELERATORS IN ADDRESSING GENDER GAP

The analysis found that there are no clear programmatic design elements that significantly address the gender financing gap. It is important to note that this was an initial analysis of programmatic design elements of different types of accelerators with a relatively small sample size, and the unclear findings suggest that this area warrants further exploration. We did not, for example, have enough data on the programs to know whether they were explicitly designed to address the gender financing gap.

Overall, the findings suggest that accelerators need to develop more strategies to address the gender financing gap. Accelerators traditionally focus on startup-centric strategies — those that are meant to influence startup behavior. One potential strategy to explore is the role accelerators can play in more intentionally influencing investor behavior.

Our hypothesis is that effective interventions will need to be more holistic, reaching beyond addressing startup behaviors and focusing on influencing the behavior of investors. To more effectively address the gender financing gap, accelerators have a role to play in helping mitigate investor bias and risk perception.



**Effective interventions will need to be more holistic, focusing on influencing the behavior of investors.**

## Recommendations

Through this research, we were able to establish how accelerators are currently impacting the gender financing gap. We see that acceleration seems to have an outsized impact on the ability of male-led startups to raise equity, thereby increasing the equity gap, and an outsized impact on the ability of female-led startups to raise debt, thereby reducing the disadvantage female-led startups face when raising debt. We are not able to explain the gap based on any quantifiable aspect of either the startup or the founder, other than the gender make up of the founding team.

Building on a growing body of research, this analysis suggests that the gender makeup of the founding team is strongly influencing the disparity in capital allocation by investors, suggesting that the potential for bias in investor decision making or a higher perceived risk for female-led startups, and that as the perceptions of risk decrease, so may the opportunity for investor bias.

Addressing the gender financing gap will require going beyond the status quo: we will need to develop new strategies and test the effectiveness of those strategies compared to the established baseline. We need to innovate in our approach to make real progress toward gender parity in entrepreneurship.



We have developed a series of hypotheses to test and explore throughout accelerator programs over the next year. As we continue to learn from testing these hypotheses, we will release a toolkit for accelerators and investors, outlining concrete actions that they can take to close the gender financing gap.

We encourage interested accelerators and investors to do the same. Here are a few recommendations to help get started.

### 1 Pursue Strategies to Mitigate Investor Bias

Investor bias, or at the very least the gender makeup of the founding team, is influencing the gender financing gap. Simple introductions between female-led startups and investors will not be enough to overcome this influence. We recommend that accelerators and investors identify strategies that focus intentionally and explicitly on mitigating investor bias. These strategies could include rethinking how investors make investment decisions, such as addressing the methodology or criteria, and who is at the decision-making table. They could also include priming investors with information to reduce this bias, for example through implicit bias training.

### 2 Reduce Perceptions of Risk

Risk seems to have a positive relationship with bias: the more we can do to decrease the perception of risk, the more we may be able to reduce opportunities for bias. We recommend that investors and accelerators consider incorporating less risky financing products, like debt, revenue-share, or hybrid structures, and develop strategies to reduce perception of risk for female-led startups.

### 3 Influence Investor Behavior

Most of the research on the gender financing gap recommends strategies that focus on altering entrepreneur behavior — for example, encouraging female-led startups to employ stereotypically “male” behaviors or answering questions differently than how they are posed when pitching their business. However, scholars know less about what investors can do to increase their investments in female-led startups. Although strategies on both sides of the equation are important to help early-stage startups become investment-ready, we recommend that investors and accelerators consider and test new ways of influencing investor behavior, providing investors with tools and strategies — not unlike the way they provide those things to startups — to make better, rational decisions.

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- 17 Global Accelerator Learning Initiative, "Entrepreneurship Database," accessed February 11, 2020, <https://www.galidata.org/entrepreneurs/>
- 18 We will note any changes in the sample size based on the type of analysis in the report by indicating "N" in each graph.
- 19 This includes startups that were rejected from the accelerator program, as well as those that ultimately decided not to participate or complete the program for other reasons.
- 20 Sample size reduces significantly due to drop-off in number of survey respondents given the self-reporting nature of surveys.

- 21 We decided to evaluate the gender differences in two groups: all men and at least one woman, rather than dividing into three groups: all men, all women, mixed gender, to both align with how the gender financing gap is commonly evaluated in the private equity industry and to maintain similar sample sizes between the two groups.
- 22 Note: because the surveys rely on self-reported data, respondents may have captured the amount of capital they raised through convertible notes, which is a debt-like financing structure that converts to equity upon an equity financing round, in either the debt or equity fields. Because convertible notes are intended to become equity, we anticipate that most founders captured as equity, but are unable to verify.
- 23 International Finance Corporation, "Moving Toward Gender Balance in Private Equity and Venture Capital," 32
- 24  $N = 2122; p > 0.00$
- 25  $N = 2122; p > 0.031$
- 26  $N = 2122; p > 0.000$
- 27  $N = 1448; p > .0039$ . Note: Although the findings for female-led startups that completed a program were not statistically significant, when comparing to the statistically significant findings that female-led startups that did not participate in a program were disadvantaged combined with the difference in the statistically significant increase in debt raised between female-led startups that participated and those that did not, we can draw the conclusion that the disadvantage for female-led startups seems to disappear when they participate in an accelerator.
- 28 It is worth noting that, generally speaking, accelerators tend to attract tech and tech-enabled businesses at relatively similar stages and with relatively similar growth profiles. This is different than a dataset analyzed from financial institutions that might comprise a wide variety of entrepreneurs, from micro and small businesses to high-growth tech-enabled startups.
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- 44 This analysis was conducted with application data for 187 programs in GALI's dataset, to gather baseline information, rather than the 83 in our sample size, which was limited to programs that provided programmatic data, had at least two female-led and two male-led startups in the cohort, and supported for-profit startups.

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