FINAL TECHNICAL REPORT_FUNDAÇÃO GETULIO VARGAS

Flávia Alfenas Amorim

Flávia Alfenas Amorim

IDRC GRANT / SUBVENTION DU CRDI : - GENDER DISPARITIES, CAREER CHOICES, AND WAGE DYNAMICS IN SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS OCCUPATIONS IN BRAZIL

FGV EPGE
ESCOLA BRASILEIRA DE ECONOMIA E FINANÇAS

Final Technical Report

Gender Disparities, Career Choices, and Wage Dynamics in STEM Occupations in Brazil

IDRC GRANT NUMBER: 109323

Research Institution: Getulio Vargas Foundation

Country: Brazil

Team:

Cecilia Machado (PI, FGV EPGE)
Laísa Rachter (Co-PI, BID)
Flávia Alfenas (Project Manager)
Mariana Stussi (Researcher, UFRJ)
Maria Eduarda Perpétuo (Researcher)
Fábio Schanaider (Researcher, FGV EPGE)

Period: March 2020 – March 2023

31st March 2023

TABLE OF CONTENTS

1. Synthesis:

This document summarizes the findings of the research project entitled "**Gender Disparities, Career Choices, and Wage Dynamics in STEM Occupations in Brazil**," funded by IDRC and coordinated by Getulio Vargas Foundation (FGV). The project, led by Cecilia Machado, was selected for funding as part of the call for proposals "**Breaking Systemic Barriers to Women's Participation in Science**" (IDRC Program: Education and Science, Officer: David O'Brien) starting in March 2020 and lasting for three years. This document was organized under IDRC's Guidelines for Preparing Final Technical Reports.

While science, technology, engineering and mathematics (STEM) are crucial to fostering human capital and innovation, women remain underrepresented in these fields, even though their involvement is essential to a country's productivity. This project was proposed to advance the understanding of gender differences in STEM fields in Brazil. It makes a novel contribution to understanding the causes and consequences of gender gaps by analyzing national longitudinal data on firms and employees in research institutions, government-owned enterprises, and private enterprises. It also fills a gap by providing a better understanding of what STEM is in Brazil.

Three main objectives were stated as following: (i) to advance in understanding the gender differences over time in STEM occupations in Brazil; (ii) to contribute to the academic and public debates on women's status in science and technological development; and (iii) to explore, engaging the public and private sector, how the research findings might inform their recruitment, remuneration, retention, and promotion policies to counter gender gaps. Based on the qualitative evidence from the in-depth interview that took place on the first year of the project's execution, these objectives were expanded to include two topics: higher education in STEM fields; and gender inequalities for women with a formal job at the intersection of maternity.

Exploring a novel dataset -- a linked employer-employee panel covering 15 years of data -- we were able to track participation and earnings for women in the Brazilian labor market, enhancing our understanding of gender gaps both in entry and progression of workers through their careers in the STEM fields, thereby helping us uncover novel findings on the disparities across gender in that sector. For instance, we found that the motherhood penalty is lower in STEM when compared to the overall formal labor market. We have also documented that women graduating in STEM are less likely than men to stay in STEM jobs throughout their professional careers. These findings indicate that women's representation in STEM occupations results from disparities in the choice of a college degree, differential progression rates in the labor market and maternity penalties, urging that policies at all these

levels are needed to foster women's participation in STEM occupations in Brazil. The research findings from this project -- status quo situation of women in STEM in Brazil -- are being presented and disseminated to academic and non-technical audiences.

This Final Report describes the project's major advances during its three years of execution through the following topics: (i) how the researchers' understanding of the research problem has evolved during this period; (ii) a discussion of whether or not the objectives were met and how they evolved; (iii) a description of the research methods; and (iv) activities performed to reach the research objectives; (v) a complete list of the projects' deliverables and the main outputs associated to each of them; (vi) a discussion on the main resulting consequences of the project (outcomes); and (vii) an overall assessment of the project.

2. The Research Problem:

Gender discrimination imposes costs not only for women but for all of society by affecting productivity and harming economic development. Women's participation offers many benefits to society: it diversifies the provision of public goods, increases investment in children's healthcare and education, increases social mobility, and reduces cross country GDP divergence. In firms, female leaders increase female productivity leading to better firm performance; female top leaders inspire others leading to an increase in enrollment and the likelihood of graduating.

The project "Gender disparities, career choices, and wage dynamics in science, technology, engineering and mathematics occupations in Brazil" aims to advance the understanding of gender disparities in STEM fields in Brazil.

This project's main research problem was to document the disparities of women's participation in STEM occupations and how they have evolved in Brazil. Prior research has found that women in STEM fields publish less, are paid less for their research and do not progress as far as men in their careers. The project makes a novel contribution to understanding the causes and consequences of these gender gaps by analyzing national longitudinal data on firms and employees in research institutions, government-owned enterprises, and private enterprises. Tracing changes over 15 years enabled the researchers to track both the entry and the progression of workers in the STEM fields through their careers and to determine whether the gender gap in STEM is mainly explained by wage differences at the beginning of the career or by differences in the career paths. Identifying these disparities and their determinants is fundamental to guide policies to reduce gender gaps in STEM.

To implement that, we proposed decomposing the gender gaps in earnings and participation by occupation over the life-cycle. The empirical framework proposed in the First Interim Report was implemented during the project's second year. Also, based on the qualitative findings of the first year, we expanded the research problem scope to document the gender disparities in higher education in STEM fields and gender inequalities for women at the intersection of maternity. Our approach was novel on multiple dimensions. In addition to the dataset explored and looking at the Brazil angle, we have contributed to the literature by uncovering new findings. Beyond that, we have collaborated to the public debate by producing articles and Op-eds for newspapers to disseminate the project results in the media.

During the project´s third year, we expanded the econometric analysis to examine the consequences of paid maternity leave for women in STEM occupations. We conduct an event study in a panel of STEM women to estimate the penalties associated with childbirth. Our results suggest that the employment penalties are smaller for women in STEM when compared to the formal labor market. While Machado (2022) found that there is a decrease of 41% in the likelihood of employment for women in the formal labor market one year after the leave, the penalty for STEM women is smaller, although still relevant: about 25% of STEM women are no longer formally employed one year after the leave. About a third of women in STEM drop out from the formal labor market after 48 months. We also estimate the effects of paid maternity leave on wages and found a wage drop in the months following maternity leave. By the 48th month after the maternity leave date, the penalty is about 25-29%. Once again, the STEM wage penalty is smaller than the 36% observed in the formal labor market (Machado, 2022).

Understanding these effects on STEM occupations is extremely important since it may be an additional layer to affect women's participation and progression in STEM, suggesting that different policies may be needed to promote higher attachment of women in these occupations and on the labor market.

3. Objectives:

The general objective of this project was to understand the dynamics that shape women's participation and careers in STEM occupations in Brazil.

The specific objectives were to:

1. To advance in understanding the gender differences over time in STEM occupations in Brazil.

2. To contribute to the academic and public debates on women's status in science and technological development.

3. To explore, engaging the public and private sector, how the research findings might inform their recruitment, remuneration, retention, and promotion policies to counter gender gaps.

The general and specific objectives were met through the qualitative and quantitative analyses carried out by the research team, alongside with efforts to disseminate the results and core messages in the media and through the engagement with other stakeholders. The dissemination efforts included newspaper reports, economic-related blogs, and discussion forums presentations. The research findings were documented in 8 reports that covered the dynamics that shape women's participation and careers in STEM occupations in Brazil over time. Based on the qualitative evidence from the in-depth interview that took place on the first year of the project's execution, these objectives were expanded to include two topics: higher education in STEM fields and gender inequalities for women with a formal job at the intersection of maternity. This latter objective was addressed in the third year of the project.

More specifically:

1. We advanced in understanding the gender differences over time in STEM occupations in Brazil by the elaboration of reports that have documented the status quo of the sector in Brazil (educational and labor market), as well as gender inequalities in different subfields:
    a. The in-depth interviews with STEM female professionals provided understanding on their perception on the challenges and opportunities of STEM occupations in Brazil.
    b. In addition, the quantitative research provided an outlook of the STEM Brazilian labor market with a gender perspective and an overview of STEM in Brazilian higher education, with attention to the issue of gender diversity. The dynamics of the gender gap over time and over the life cycle in STEM occupations in Brazil was explored through quantitative analysis and an additional study on the impact of paid maternity leave for women working in STEM was conducted.

2. We have contributed to the academic and public debates on women's status in science and technological development:
    a. The major advance was in the public debate through the production of articles and Op-eds for newspapers to disseminate the results in the media.
    b. The article produced in the project's third year that looks into the child penalty for women in STEM has greater academic potential, as its empirical strategy can speak to the causal effect of children on women's work trajectory in a sector that favors technology adoption and flexible work schedules.
    c. The construction of a taxonomy to classify STEM occupations from the Brazilian Occupations Code System and the Brazilian Higher Education Census also contributed to the academic and public debates by filling a gap and providing a better understanding of what STEM is in Brazil.
3. We explored how the research findings might inform recruitment, remuneration, retention, and promotion policies to counter gender gaps through engagement with public and private sectors and other stakeholders:
    a. Outreach efforts through newspaper reports, blogs related to the economy, and presentations on discussion forums played an important role in achieving this goal.
    b. Webinar "Female participation in the STEM job market in Brazil", to be held on April 19, in partnership with the Inter-American Development Bank (IDB). We invited leaders, specialists from different fields and civil society for a presentation of the main results of the research and dialogue on the barriers and actions to promote the participation of women in STEM. The purpose of the event is to identify points of consensus that make it possible to build a comprehensive strategy to reduce inequalities in these sectors.

4. Methodology:

Below is a complete description of the data used to assess the objectives outlined and the steps taken to achieve the project results. In section 6 we explicitly link data to each of the papers and reports were they were used:

Data

We proposed to study gender disparities, career choices, and wage dynamics in STEM occupations in Brazil using a dataset called RAIS (*Relação Anual de Informações Sociais*).

RAIS is a longitudinal dataset that covers the universe of formal firms and workers in Brazil. It contains information on firm identifiers (CNPJ - National Registry of Legal Entities) and worker identifiers (PIS – Social Identification Number), demographic characteristics of workers such as gender, age, race, and education, industry, type of company (public vs. private) and characteristics of the employment contract (such as date of dismissal/admission, wages and hours worked per week).

With the establishment identification number (CNPJ), it is possible to follow all establishments that file the RAIS survey over time. Moreover, with the worker's national insurance number (PIS), it is also possible to follow all workers that remain in the formal sector over time and to match the workers' characteristics with those of the establishments, through RAIS. Therefore, we could form a panel that matches workers to their establishments and follows each of them over time.

To define whether the individual works at a STEM occupation, we used information on worker's occupations at a given firm, that is described by specific five-digit codes following the Brazilian Occupational Classification (CBO). CBO is similar to the International Labor Organization's International Standard Classification of Occupations. There are more than two thousand different occupational categories in the data. Examples of occupations in the STEM include "Aerospace Engineer", "Biochemists and Biophysicists", "Statisticians".

The industrial classification of firms' activities is reported according to the Brazilian National Classification of Economic Activities (CNAE), at the five-digit level. Examples of firm activities in STEM fields include "Research and experimental development on biotechnology", "Research and experimental development on social sciences and humanities", and "Manufacture of engines and turbines, except aircraft, vehicle and cycle engines".

Table 1: Dataset, source and period

Dataset	Source	Period
Relação Anual de Informações Sociais (RAIS)	An administrative dataset that contains linked employer-employee records collected by the Ministry of Labor	2003-2019
Pesquisa Nacional por Amostra de	A national household survey carried out by the Instituto Brasileiro de Geografia e Estatística (IBGE) with the aim of	2012-2019

Domicílios Contínua (PNADC)	continuously producing information on the labor market, associated with demographic and educational characteristics.	
Higher Education Census (HEC)	Carried out annually by the Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira (INEP), the HEC is the most complete research tool in Brazil on higher education institutions, as well as on their students and professors.	2010-2019
Census	Carried out by the Instituto Brasileiro de Geografia e Estatística (IBGE)	2010

Empirical Framework

For the qualitative report, in-depth interviews with STEM female professionals were conducted to understand, through their professional experience, their perception on the challenges and opportunities of STEM occupations in Brazil. The semi-structured questionnaire used to carry out 12 in-depth interviews can be found in the report's Appendix: Women in STEM: How do they perceive the barriers to career development?

For the quantitative analysis, the panel data structure for workers and firms across several years enabled us to construct descriptive statistics on the differences in participation (extensive and intensive margin), wages, retention, and promotion opportunities in STEM occupations between female and male professionals.

The research procedures included: (i) treating and cleaning the raw data to build the panel data set; (ii) selecting activities and occupations in the STEM field; (iii) building the relevant indicators; (iv) performing econometric analysis to achieve the proposed objectives.

The empirical framework used decomposition methods of labor force participation and wage gap by occupation and industry similar to the ones used by Goldin (2014), Goldin, Olivetti, and Barth (2017), among others. We also implemented econometric models to estimate how labor participation and log earnings is affected by various observables, such

as a quartic in age, education dummies, race, years, log hours, occupation dummies, a female dummy, and an interaction of occupation and female.

The Brazilian administrative data were used to: i) build a STEM definition using Brazilian occupation codes; ii) provide an outlook of the STEM Brazilian labor market with a gender perspective;; iii) document the dynamics of the gender gap over time and over the life cycle in STEM occupations in Brazil; and, iv) study the impact of paid maternity leave on labor market for women working in STEM. We also used higher education census to shed light on the gaps in undergraduate studies, and Population Census Data to estimate the correlation among labor market outcomes and educational choices and to estimate the wage premium of graduating in STEM degrees and working in STEM jobs.

There are some shortcomings in our econometric approach that should be highlighted. Because we observe individuals after they have chosen their occupation, career choice is given in our analysis. Therefore, we are not able to measure the determinants of choice carriers in STEM. Besides, our analysis is quantitative, so all unobservable factors that explain career choices that are not group-specific and/or change over time are not explained. This includes, for instance, quality of life considerations that might explain where women seek employment. However, it is essential to highlight that our analysis is informative about occupational choices to the extent that career progression changes the (expected) returns from different occupations, thereby changing which industries women seek employment.

5. Main Findings:

By examining changes in participation and earnings over a 15-year period, we were able to gain insight into gender gaps that exist in both the entry and progression of workers in STEM fields throughout their careers. This allowed us to uncover new findings about gender disparities in STEM in Brazil. Our research suggests that the underrepresentation of women in STEM fields is due to differences in the choice of college degree, unequal rates of advancement in the job market, and the negative impact of motherhood on careers. To promote the participation of women in STEM fields in Brazil, policies are needed at every level of education and employment. More specifically, the research showed that:

In-depth interviews

- Women declare they spend more time than men on household chores and childcare;

- The performance assessment that determines career'' progression is based on male norms;
- Unconscious biases and gender stereotypes hinder the trajectory and female progression.

Labor Market

- The number of STEM workers in Brazil is still small both in absolute and relative terms and corresponds to only 2.6% of the total formal workers;
- The share of women among STEM workers is lower than in the formal sector as a whole (26% vs 45%);
- The wage gap in STEM is lower than in the formal sector as a whole (7% vs 11%), but increases as other characteristics are controlled for. This suggests that women in STEM jobs have better producing characteristics than men, even though they have similar educational degrees at first glance.

Education

- Although they represent the majority in higher education (57.4%), women are still a minority in STEM fields (28.8%);
- Physical and Life Sciences have an even gender split, while Architecture and related fields have a higher proportion of female students (66%). In contrast, only 14% of students in Computer and Math fields and 29% in Engineering are female, contributing to the gender gap in STEM enrollment;
- In terms of flow, women make up a larger share of graduates when considering the number of entrants.

Gender pay gap during life cycle

- The gender gap has been narrowing and stabilizing among younger cohorts in the STEM market;
- Little stability in holding a STEM job, and women have a harder time holding these jobs for multiple years;
- Occupational and firm controls explain together around 60% of the earnings gap in STEM occupations. Differences in occupations and sorting through firms are important factors to explain the wage gap.

Life-Cycle wage premiums

- Women graduating in STEM are 13 p.p less likely to hold a job in STEM than men.

- 12.2% is the wage premium to graduating in STEM in Brazil. More modest than the award for Medicine (75.5%) or Law (36.6%) premium;
- Heterogeneity was observed in the wage premium across STEM sub-fields and differences in the STEM wage premiums between Brazil and developed countries. Wage premiums are considerably higher for Engineering and Architecture subfields.
- The patterns of selection across different STEM sub-fields are different between women and men. However, women are 60% of the graduates of “Physical and Life Sciences” but only 26% of the graduates of “Engineering and Architecture”. This implies women concentrate in STEM degrees with the lowest premiums while men in the STEM degrees with highest premiums, increasing the gender gaps within STEM.

Child Penalty in STEM

- For women working 24 previous months in STEM, after 12 months there is a 25% drop in employment and by the 48th month after the maternity leave the penalty reaches more than a third;
- Women’s earnings drop 25% in the 12 months after the arrival of a child and about 25-29% until the 48th month;
- These penalties are smaller in STEM than in the overall formal labor market;
- We identify whether women who remained employed changed the occupation held, that is, whether there was a drop in STEM occupations. We find that 3.8% of STEM women switched to non-STEM occupations 12 months after the leave. Following the subsequent months, by the 48th month this penalty was 15.7%.

6. Project Outputs:

For those interested in replicating this research, here you can access the project´s GitHub repository. Below is a complete list of the project deliverables, main outputs by year and the datasets associated with each of them (when applicable). The outputs described are available at **IDRC Connect**:

First year:

Table 2: Project deliverables and main outputs, first year

Deliverable	Main Output

Capacity building	1. Three research assistants trained to help with the data organization and analysis. 2. Training for the project''s Co-PI. This position has contributed to Laisa's career and current job at the IDB as a gender and diversity specialist. At the moment, Laísa is developing work and research about women in STEM at the Bank and was responsible for a partnership established between FGV and IDB within this project. The collaboration includes a webinar to be held on April 19 and further dissemination of the project results.
Report "Women in STEM: How do they perceive the barriers to career development?"	Perceptions of STEM female professionals on the challenges and opportunities of STEM careers in Brazil. Dataset: transcription and classification of in-depth questionnaires
Report "STEM Classification in the Formal Labor Market in Brazil"	Taxonomy to classify STEM occupations from the Brazilian Occupations Code System Dataset: RAIS
Report "STEM Classification for Brazilian Higher Education"	Taxonomy to classify STEM educational fields from the Brazilian Higher Education Census. Dataset: Brazilian Higher Education Census (HEC)
Report "Women in the STEM Labor Market in Brazil'	STEM Brazilian labor market outlook with a gender perspective over the last 17 years. Understanding on how gender is related to participation and success in STEM jobs. Dataset: RAIS, PNADC
Report "Brazilian Higher Education and STEM Fields"	Overview of STEM in Brazilian higher education, with attention to the issue of gender diversity in STEM fields. Dataset: Brazilian Higher Education Census (HEC)

Crosswalks. The spreadsheet can be accessed in this link.	List of STEM occupations in Brazil with a crosswalk of **Standard Occupational Classification** (SOC) Code system
Report "STEM Workers in the Brazilian Labor Market: Evidence from Household Surveys'	This report focuses on the distinction between workers in the formal and informal sector of the economy. In Brazil, nearly 45 percent of workers are informal. We document that roughly 26 percent of the STEM workforce works in the informal sector. Women are under-represented in the STEM workforce in general (34%), whites are the majority of the STEM workforce (71%) both in the formal and informal sector. Dataset: Brazilian Household Survey (2012 to 2020)

Second year:

Table 3: Project deliverables and main outputs, second year

Deliverable	**Main Output**
Article on Valor Econômico – "Mulheres são só 26% em profissões tecnológicas". The same article was also published in English in Valor International (with the title Brazilian women underrepresented in the STEM field).	Presentation of the status quo of female participation in the STEM formal labor market in Brazil.
Op-ed written by Cecilia Machado for Folha de São Paulo – "Países desenvolvidos investem cada vez mais em ciência, engenharia e matemática".	Discussion on the relevance of STEM and how the sector was less impacted for the economic crisis arising from the pandemic.

Op-ed written by Cecilia Machado for Folha de São Paulo – “O compromisso com o atraso e a má alocação de talentos".	Discussion on the misallocation of talents in high-paying occupations, especially STEM, and its implications for productivity.
Article on Conjuntura Econômica blog – “Desafios para reduzir a sub-representação feminina nas ocupações em ciência, tecnologia, engenharia e matemática (STEM)".	Discussion on the challenges to reduce female underrepresentation in STEM occupations. The article included inputs from Laboratoria, made possible through the engagement of the workshop organized together with CIPPEC in the first year of the project 's execution.
Report “The Gender Pay Gap during Life Cycle in the STEM Labor Market”	Dynamics of the gender gap over time and over the lifecycle in STEM occupations in Brazil. Dataset: RAIS
Report “Life-Cycle Wage Premiums and STEM in Brazil”	Estimation of the life-cycle wage premiums of STEM college graduates and STEM workers in Brazil. Dataset: RAIS

Third year:

Table 4: Project deliverables and main outputs, third year

Deliverable	**Main Output**
Report “Child Penalty in STEM: Evidence from Brazilian Labor Market”.	Analysis of the impact of having a child on labor market outcomes (specifically employment, and wages) for women working in the formal STEM labor market.

Executive summaries	• Project Summary • The Gender Pay Gap during Life Cycle in the STEM Labor Market. • Women in the STEM Labor Market in Brazil. • Brazilian Higher Education and STEM Fields. • Maternity Leave.
Webpage:	A repository to present the project´s main findings and to ensure open access to its deliverables.
GitHub repository	STEM Classification tables in .csv for CBO-2002, Household CBO and HEC degree codes; and Reports with a guide and full disclosure of the classification processes
Webinar “Female participation in the STEM job market in Brazil”	Held on April 19, in partnership with the Inter-American Development Bank (IDB). Presentations Recording

7. Project Outcomes

The project made a novel contribution to understanding the causes and consequences of gender gaps in Brazil by analyzing national longitudinal data on firms and employees in research institutions, government-owned enterprises, and private enterprises. Tracing changes over 15 years enabled us to track both the entry and the progression of workers in the STEM fields through their careers. The approach allowed us to determine whether the gender gap in STEM is mostly explained by differences in wages at the beginning of the career or by differences in the career paths. It was also innovative by providing a recent and comprehensive overview, with stylized facts, of STEM in the formal Brazilian labor market,

and by presenting the employment and wage penalties that women in STEM occupations suffer after taking maternity leave. Identifying these disparities and their determinants is fundamental to guide policies aimed at reducing gender gaps in STEM.

Other project outcomes are:

- The project filled a gap in the definition of STEM careers and courses in Brazil, based on the construction of a taxonomy to classify STEM and non-STEM occupations, as well as STEM educational fields, considering Brazilian occupational and educational classification code systems.
- The outreach efforts through newspaper reports, blogs related to the economy, and presentations on discussion forums played an important role to put the project´s agenda on the public debate and to better inform how the research findings might inform recruitment, remuneration, retention, and promotion policies to counter gender gaps.
- The reports produced along with its strategy of dissemination made the project´s data a reference for those interested in the female participation in the STEM area in Brazil.
- A partnership with the Inter-American Development Bank (IDB) was established for a broader dissemination of the research finds, including the organization of a webinar (to be held on 19th April) and the continuation of the research.
- Research assistants trained to help with the data organization and analysis. Therefore, instrumented for further research in the future.

8. Overall Assessment

The project opened a great opportunity to advance in policy issues as it approached gender gaps both in educational and labor market sectors. However, an important goal was to advance knowledge on relevant topics to academia such as the effects of maternity leave in women LFP in stem occupation. As we focused on exploring opportunities in other data sets, we delayed the most relevant piece of evidence we generated so far, which is the paper on maternity leave (Child Penalty in STEM: Evidence from Brazilian Labor Market). The paper on wage premium, for instance, has important information, but needs a lot of work to be published. The scenario where we focused only on the generation of the relevant information and not on a more academic paper for this set of data, while focusing the more sophisticated analysis for the last piece of work on maternity leave, would be more

productive and maybe we would have a working paper ready to be submitted in an economic journal.

In terms of project management and its performance, developing a comprehensive project plan that outlined the project objectives, scope, timelines and resource requirements was critical to the project success. It ensured that all activities were aligned with the goals and objectives stated. Establishing clear roles and responsibilities for the project team members helped us to ensure that all project activities were coordinated and that the project progress were monitored and tracked effectively. However, in terms of risk identification we were very optimistic and more focused on purely technical aspects related to the nature of the research, such as: access to databases and guaranteeing confidentiality of information. In fact, the challenging aspect was the budget administration and bureaucracy linked to it, which prevented us from contracting some of the planned services (at least as initially thought), such as: a designer and website developer. We were able, nevertheless, to minimize the impact of these risks on project outcomes.

The project allowed us to connect to non academic partners to think further about the policy implications of the barriers in STEM. The project's inputs will be shared with stakeholders and policymakers through the partnership with the Brazilian country office of the Inter-American Development Bank (IDB). The academic knowledge generated set the basis to a new agenda as it provided a diagnosis of relevant gender gaps in STEM fields and will help to prioritize policy decisions.

9. Bibliography

Goldin, C. (2014). A grand gender convergence: Its last chapter. American Economic Review, 104 (4), 1091–1119.

Kleven, H., Landais, C. & Søgaard, J. E. (2019). Children and gender inequality: Evidence from denmark. American Economic Journal: Applied Economics, 11 (4), 181–209.

Machado, C., Neri, M. & Neto, V. P. (2018). The gender pay gap and the life cycle profile in the Brazilian formal labor market. Working Paper.

Machado, C. & Pinho Neto, V. (2018). The labor market effects of maternity leave extension. Available at SSRN 3129363.

Machado, C. (2022). Brazil human capital review : Investing in people (english). In Maternity leave and women's employment in brazil. Washington, D.C. World Bank Group. http://documents.worldbank.org/curated/en/099359007012217076/IDU0c9bcb58a08ac704dbe081eb077b28ef22453

Machado, C., & Neto, V. (2016). The labor market consequences of maternity leave policies: Evidence from brazil. (Working paper, The_Labor_Market_Consequences_of_Maternity_Leave_Policies_Evidence_from_Brazil.pdf (fgv.br)

Machado, C., Rachter, L., Stussi, M., & Schanaider, F. (2021). Stem classification in the formal labor market in brazil.

Machado, C., Rachter, L., Stussi, M., & Schanaider, F. (2021). Women in the stem labor market in brazil (Tech. Rep.).

Machado, C., Rachter, L., Stussi, M., & Schanaider, F. (2021). STEM Classification for Brazilian Higher Education.

Machado, C., Rachter, L., Stussi, M., & Schanaider, F. (2021). The Gender Pay Gap during Life Cycle in the STEM Labor Market. (Tech. Rep.)

Machado, C., Rachter, L., Stussi, M., & Schanaider, F. (2021). Brazilian Higher Education and STEM Fields. (Tech. Rep.)

Machado, C., Rachter, L., Stussi, M., & Schanaider, F. (2021). Life-Cycle Wage Premiums and STEM in Brazil. (Tech. Rep.)

Machado, C., Rachter, L., Stussi, M., & Schanaider, F. (2021). Mulheres em STEM: Como elas percebem as barreiras que enfrentam? (Tech. Rep.)

Machado, C.; Perpétuo, M. E.; Rachter, L.; Stussi, M. Child Penalty in STEM: Evidence from Brazilian Labor Market. FGV, EPGE. Working Paper.