THE IMPACT OF UNIVERSAL PRESCHOOL POLICY ON

WOMEN'S LABOR MARKET OUTCOMES AND ECONOMIC

INEQUALITY IN THE UNITED STATES

by

CAITLIN DOUGHERTY

A THESIS

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Title: The Impact of Universal Preschool Policy on Women's Labor Market Outcomes and
Economic Inequality in the United States

Approved: _____*Jonathan Davis, Ph.D.*_____
Primary Thesis Advisor

This study examines the impact of early childhood education and care (ECEC) policies, such as universal preschool, on labor market participation and gender equality in the United States. While there is substantial research on the effects of ECEC in countries with universal welfare systems like Denmark, there is significantly less research exploring these impacts within the U.S. context. This gap is particularly notable regarding how such policies influence labor force metrics, poverty reduction, and economic equality across genders.

The findings reveal that a "Preschool for All" policy leads to a statistically significant increase in labor force participation among women by 1.2 percentage points, suggesting enhanced economic engagement. Wage and salary income also exhibit a positive, though not statistically significant, increase of $847.75 each year for the following five years post implementation. The effect on hourly wages shows a 53 cent increase. While both are suggestive of improvement in women's labor force participation, neither is statistically significant. Additionally, preschool for all slightly increase in weekly working hours by .11 hours, indicating that some mothers might have transitioned from part-time to full-time, leveraging the availability of preschool to balance work and childcare responsibilities. Importantly, the policy contributes to a statistically significant decrease in the poverty rate by 1.3 percentage points.

ECEC policies not only support women's entry and retention in the workforce but also act as a double reduction anti-poverty strategy, enhancing economic stability and reducing poverty among women.

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Introduction

I was inspired to write this thesis during my study abroad in Copenhagen, where I delved into the European, particularly Nordic, labor market models renowned for their success in gender equality. My term paper explored potential adaptations of the U.S. liberal welfare model, drawing from Denmark's approach to address gender inequalities in the labor market. Denmark is often cited as a leading example among Nordic countries as it has embraced a robust Early Childhood Education and Care (ECEC) system (P. Larsen, De La Porte, 2022) since the Danish childcare guarantee began in 1976 (EU Commission). The success of this program is evidenced by increasing child enrollment rates from the 1970s through 2020 for children ages two and above (Eurostat 2021). Childcare in Denmark has been recognized as a parental right (Jacobsson, 2021). Having a high-quality care system pushes parents to feel more confident in enrolling their children and improves overall gender equality in the labor market. This universal and impactful approach facilitates access to childcare and shows Denmark's commitment to child development and family support, significantly boosting gender equality in the workforce.

In contrast, the ECEC system in the United States presents a mixed economic model with significant variations across states and socio-economic groups. This is marked by limited public funding and inconsistent access to quality care. The disparity is especially severe among low-income families. A comparative analysis of these systems reveals crucial insights into their implications for gender equality in the labor market, suggesting a pressing need for policy reforms in the U.S. to better support women's evolving roles in society and the workforce.

According to Cipollone et al. (2014), highly educated women are particularly responsive to incentivizing family policies due to the Matthew effect—a phenomenon where those who begin with advantages accumulate more advantages over time, while those who start

disadvantaged become more disadvantaged over time (Griffiths, 2023). This aligns with research by Schneider (2017), which indicates that the educational divide in women's domestic labor and service expenditures widens with greater income inequality. Family policies may inadvertently exacerbate existing inequalities if they primarily benefit women with higher education and income levels. Therefore, it is crucial for policymakers to design family policies that specifically target and support disadvantaged women, such as those with lower education levels or from low-income households, to ensure that these policies promote greater equality and do not further widen disparities.

I focus on America's welfare model using "preschool for all" (PFA), due to its focus on leveling the playing field for families, as a proxy of Denmark's early childhood education and care. I examined the increase in gender equality in the labor market by looking at census data and running differences-in-differences to measure the impact of PFA policies.

Most of the existing literature on early childhood education and care (ECEC) examines its impact on children. Notable studies, such as the Perry Preschool Project and the Abecedarian Project, often considered gold standards in this field, have demonstrated significant initial benefits, including increased academic success, higher earnings, and reduced violence and crime in children (London, 2016). However, positive results tend to diminish over time—a phenomenon known as the fade-out effect. This effect describes how positive outcomes, clearly observable just after the intervention, gradually become less discernible compared to control groups within a few years. Additionally, much of the current research assesses the quality of ECEC programs and identifying which demographic groups benefit the most, analyzing various outcomes such as graduation rates, employment rates, and crime rates among participants.

Despite these insights, the exploration of ECEC policies from a labor market perspective remains relatively underexplored in the United States. This oversight is significant considering that these policies have the potential to address gender inequalities in the labor market and mitigate long-term adverse effects. By broadening the scope of ECEC research to include these perspectives, policymakers could better leverage preschool programs as effective tools for social and economic improvement.

The findings reveal that a "Preschool for All" policy leads to a statistically significant increase in labor force participation among women by 1.2 percentage points, suggesting enhanced economic engagement. Wage and salary income also exhibit a positive, though not statistically significant, increase of $847.75 each year for the following five years post implementation. The effect on hourly wages shows a 53 cent increase. While both are suggestive of improvement in women's labor force participation, neither is statistically significant.

Additionally, preschool for all slightly increase in weekly working hours by .11 hours, indicating that some mothers might have transitioned from part-time to full-time, leveraging the availability of preschool to balance work and childcare responsibilities. Importantly, the policy contributes to a statistically significant decrease in the poverty rate by 1.3 percentage points.

Literature Review

This literature review examines the existing research on early childhood education and care (ECEC) policies and their impact on women's labor market outcomes, particularly in the United States. The review draws significant comparisons with Denmark's ECEC system to illustrate the potential of such policies in addressing economic inequality and promoting gender equality in the labor market.

Empirical analyses from the past two decades highlight the evolution and impact of these policies, exploring how different racial groups are affected and evaluating these policies through the lens of welfare state regimes. The literature review also contrasts the liberal welfare model of the US with Denmark's universal welfare model, providing insights from a range of sources, including peer-reviewed journal articles, policy analyses, and empirical studies using data from repositories like IPUMS CPS.

Theory and Background

Research on welfare as an academic field significantly expanded following the end of World War II, with substantial developments occurring from the 1960s onward. A pivotal contribution to this field was made by Esping-Andersen in 1990 with his influential book "Three Worlds of Welfare Capitalism." Unlike many contemporaries who relied heavily on correlational methods, Andersen introduced a more nuanced approach, arguing that to fully understand welfare states, one must consider spending patterns, distribution, taxation, and types of expenditures.

Andersen's work led to the coining of the term "Welfare Regime," which he used to describe ideal state models that embody essential attributes and features of specific case types. His framework classified these regimes into three categories: liberal, corporatist, and universal.

Each regime is defined by its approach to decommodification—the extent to which individuals or families can uphold a socially acceptable standard of living independently of market participation—and social stratification. According to Andersen, liberal regimes are marked by limited state intervention and a high reliance on the market, focusing on individual responsibility. Corporatist regimes maintain traditional family values and emphasize work-based entitlements, while universal regimes aim for social equality through extensive state-funded services that are available to all citizens, irrespective of their market participation.

This theoretical framework is essential for understanding the various ways welfare states support their citizens and how these methods impact societal structures, including the labor market. In the context of this thesis, these categories provide a critical lens through which to view and compare the ECEC policies of the US and Denmark. The US, typically characterized by a liberal welfare regime, shows stark contrasts to Denmark's universal approach, which has implications for policies related to gender equality and economic participation. This section sets the stage for a deeper examination of how these welfare regimes influence women's roles in the labor market and the overarching impact of ECEC policies.

US Welfare Model

The ECEC system in the U.S. exhibits a complex, mixed economy model with considerable variations across states and socioeconomic groups. This system is characterized by limited public funding and inconsistent access to affordable, high-quality care. According to the National Library of Medicine, highly educated women tend to respond more actively to incentivizing family policies, benefiting significantly due to the Matthew effect—a phenomenon where advantages tend to accumulate among those already advantaged (Cooke, 2022). Furthermore, research by Schneider (2017) suggests that in areas with higher income inequality,

there is a broader educational divide in women's allocation of time to housework and service expenditures. Operating within a liberal model, the US has taken unique approaches to welfare support. While President Biden's "Invest in America" agenda signals a push towards more extensive federal investments in various sectors including gender equity, the traditional liberal approach continues to prioritize individual responsibility and minimal state involvement in social welfare (Sheet, 2022). American welfare provisions are typically hampered by stringent eligibility requirements and offer less generosity than those in corporatist or universal models.

Within this framework, critical services such as healthcare, pensions, and education are predominantly provided by the market, with the state intervening primarily as a safety net for those unable to secure their needs through market mechanisms. Social assistance programs are often means-tested, with a strong emphasis on workfare policies that condition the receipt of benefits on demonstrated job-seeking or participation in work-related activities. This approach has led to a limited availability of social services, particularly affecting single mothers and low-income women who are compelled to rely on the labor market for social security. The US lags other developed nations in providing adequate maternity leave and childcare support, which hampers women's participation in the workforce and exacerbates gender inequality. The lack of sufficient childcare creates a cycle where parents, especially mothers, are forced to work longer hours to meet family needs, compounded by the scarcity of early ECEC services and resulting in increased financial and emotional strain (Katz, 2008).

Use and Availability of Childcare

Investment in ECEC stands as a powerful lever for advancing gender equality in the labor market. Reliable and quality childcare enables women, who traditionally shoulder most family care responsibilities, to participate more fully in the workforce. By mitigating one of the primary

barriers to employment and career progression for women, ECEC facilitates their ability to pursue professional opportunities without sacrificing their roles in family care. Accessible ECEC services not only help level the playing field, allowing women to balance motherhood with careers, but also challenge traditional gender roles by promoting a more equitable distribution of caregiving responsibilities between parents. This shift supports the development of dual-earner households, which are crucial for economic growth and societal development. Moreover, high-quality early childcare impacts more than just participation rates; it influences pay equity as well. Women who can remain in the workforce without taking extensive breaks are less likely to face the wage penalties that often accompany periods of unemployment or part-time work due to caregiving responsibilities.

Thus, ECEC is not merely a social policy but an economic strategy that can drive a more gender-inclusive labor market, fostering both equality and economic resilience.

America's Preschool for All as a Proxy for Denmark's Universal Childcare

Denmark's publicly funded system is financed through high taxation levels and aims to promote social equality by ensuring all children, regardless of their parents' economic status have access to quality ECEC. This benefits the families directly, but also contributes to the country's economic productivity as an investment in both the current and future workforce.

PFA in America is a policy initiative aimed at expanding access to high-quality early childhood education for all children, especially focusing on the critical years before kindergarten. This initiative, set forth over 50 years ago, is designed to provide all low- and moderate-income four-year-olds with access to high-quality preschool programs, with the goal of promoting early learning and development. The initiative encourages states to serve additional children from

middle-class families too, and it supports the inclusion of full-day kindergarten and early education programs for children under four.

The policy is based on the understanding that early childhood is a crucial period for cognitive and social development. The earlier the intervention, the more time the individual will reap those benefits. Several studies show that starting earlier also lessens the likelihood of repeating grades or committing crimes (Shaw, 2022). Providing universal access to preschool education is seen as a strategic investment with long-term benefits for children, families, and society at large. So far, it varies state by state with different funding mechanisms (federal, state, and local) supporting the mission and implementation.

Preschool education offers critical benefits for children's development, including brain development and improvement in later life outcomes. Studies like the Carolina Abecedarian Project and the Perry Preschool Program provide compelling evidence of the long-term benefits of investing in early childhood education, emphasizing the importance of quality in preschool programs. The studies above look at the impacts on likelihood to work full-time and that was positive and lead to greater labor force participation overall, specifically increasing women's participation by 9.7 percentage points (Fessler, 2019). However, they didn't look closely into the impact on parents and the impact on mother's labor force factors.

The current state of preschool education in the United States is characterized by under enrollment and significant disparities in access and quality. Compared with other industrialized nations, the U.S. has a lower percentage of children enrolled in preschool program (OECD, 2024). This discrepancy is even more pronounced among children from low-income families, who are less likely to enroll in high-quality early education programs. Despite an increasing recognition of the value of early childhood education, the progress toward universal or

widespread state-funded preschool programs has been slow, suggesting a need for more substantial investment and policy reform (U.S. Department of Health and Human Services).

Access to affordable preschool programs remains highly uneven across the country. According to the National Institute for Early Education Research's (NIEER) State of Preschool Yearbook, only six states (Florida, Iowa, Oklahoma, Vermont, West Virginia, Wisconsin) and the District of Columbia have fully implemented universal preschool programs available to all 4-year-olds, regardless of income (NIEER, 2023). Vermont and D.C. are the only two extending this universal access to three-year-olds as well. Four additional states (Georgia, Illinois, Maine, New York) have policies in place for universal preschool that have not yet been fully implemented due to funding constraints and other barriers. Several others like California, Colorado, Hawaii, and New Mexico have recently passed legislation to move towards universal preschool access in the coming years. The remaining states operate a mishmash of targeted preschool programs, with eligibility often limited based on family income levels or other risk factors. Even within states with universal policies, actual enrollment rates for four-year-olds vary widely, with some like Florida achieving over 70% participation deemed "universal" by NIEER, while others like New York have struggled to enroll even 50% of four-year-olds.

There is also significant variation in whether these state preschool programs offer full-day or part-day/part-year schedules. Research indicates full-day programs better support working families and produce larger educational benefits for children. However, funding limitations often lead states to opt for part-day models that are more affordable but less compatible with parental employment.

At the federal level, the Biden administration is actively advocating for the establishment of a universal, government-funded preschool system for all children aged three and four

(Administration for Children and Families, 2022). President Joe Biden enacted a $1.5 trillion (about $4,600 per person in the US) budget for the 2022 fiscal year. This budget allocates over $584 million in extra funding towards childcare and early education initiatives, encompassing programs like Head Start, Early Head Start, and the Childcare and Development Block Grants.

Head Start is a comprehensive early childhood education program in the United States designed to foster the development of low-income children. Initiated in 1965 as part of President Lyndon B. Johnson's War on Poverty, the program's primary goals are to enhance the social and cognitive development of children through the provision of educational, health, nutritional, social, and other services (First Five Years Fund, 2020). Head Start offers a range of services, which include early learning and development through education; health services such as immunizations, dental, vision, and mental health screenings; nutritional services that provide healthy meals and snacks; and family support services that engage families in their children's learning and help them in making progress toward their educational, literacy, and employment goals (National Head Start Association, n.d.).

According to the National Institute for Early Education Research (NIEER), preschool enrollment reached a record high across all programs in the 2022-2023 period, increasing by 7% from 2021-2022. Currently, approximately 7% of 3-year-olds and 35% of 4-year-olds are enrolled in preschool nationwide, including government-funded institutions. With this, preschool spending also reached an all-time high with states spending $11.73 billion on state funded preschool in 2022-2023, an 11% increase year-over-year (NIEER, 2023).

Universal preschool education also presents significant benefits for parents, particularly in supporting workforce participation. By providing affordable and accessible early childhood education, parents, especially mothers, can more easily balance work and family responsibilities

(Hook, 2020). This support is crucial for economic stability and contributes to reducing gender inequality in the labor market by enabling both parents to pursue employment opportunities. This is exactly what we will be looking at throughout this paper from IPUM's cencus data.

Major Findings: Early Childhood Education and Care Spending and Enrollment Rates

This section of the literature review explores the stark disparities in Early Childhood Education and Care (ECEC) funding and its direct implications for enrollment rates, which in turn influence gender equality in the labor markets of Denmark and the United States.
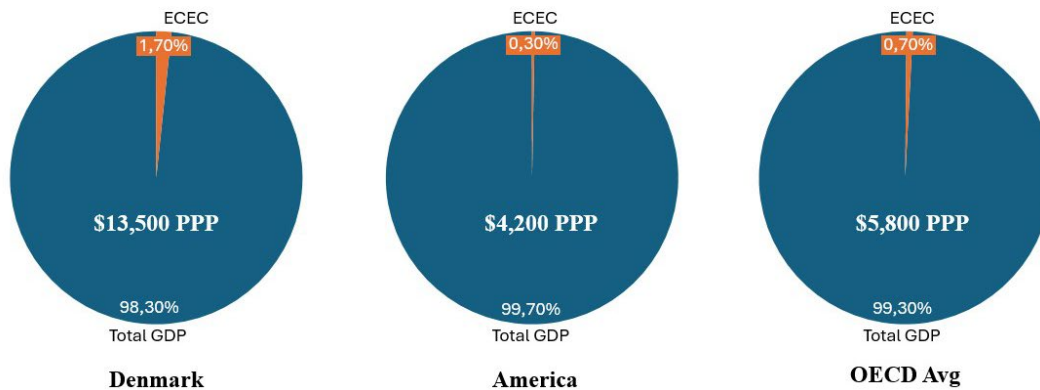
ECEC Spending Analysis

Figure 1: Total GDP Spend vs ECEC Spend by Country in Percentage and Purchasing Power Parity

Denmark allocates a substantial portion of its GDP—1.7%—towards ECEC, according to The Organization for Economic Corporation and Development (OECD) (a unique forum where 37 democracies collaborate to promote economic growth), Denmark is among the highest spenders globally. This high level of investment is indicative of the Danish government's prioritization of early childhood development as a critical component of public welfare and economic strategy. Conversely, the United States allocates only 0.3% of its GDP to ECEC. This disparity not only highlights the relatively lower priority given to early childhood services in the

US but also points to a broader ideological difference regarding public welfare investment. When examining ECEC expenditures relative to total government spending, Denmark's commitment becomes even more apparent, with ECEC accounting for approximately 8.4% of its total budget. This compares to a mere 2.3% in the United States, reflecting differing fiscal priorities and potentially impacting the quality and availability of ECEC services.

In terms of per child spending in 2020, Denmark's investment in ECEC services reaches approximately $13,500 USD (purchasing power parity, PPP) per child aged 0-5, one of the highest among OECD countries. This investment is nearly triple that of the US, which spends about $4,200 USD (PPP) per child, not only falling below the OECD average but significantly trailing behind Denmark's expenditure. This stark contrast in per child spending underlines the differences in how each country values and invests in early childhood education.

Enrollment Rates and Gender Equality

Enrollment rates in ECEC services and primary education for children aged 3 to 5 years are significant indicators of the effectiveness of these investments and their broader social implications because high enrollment rates often correlate with the availability and affordability of quality ECEC, which can have a direct impact on gender equality in the labor force.

Denmark's enrollment rate stands at an impressive 98%, demonstrating its commitment to universal access and reflecting substantial public investment in subsidized childcare and preschool. This high enrollment rate is aligned with Denmark's social welfare model, which emphasizes social equity and comprehensive child development. Correspondingly, Denmark has maintained relatively stable employment rates for women, as depicted in Appendix 1, showing a difference in female labor force participation by 9% between 2018 and 2022, from 71% to 65% compared to the United State labor force participation difference in female labor force

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participation by 16 percent each year between 2018 and 2022 (OECD). For a more detailed view of the employment rates by gender in Denmark and the US, refer to Appendix 1.

In contrast, the United States exhibits a significantly lower enrollment rate of 40% falling below the OECD average of 87% (U.S. Census Bureau, 2023; OECD, 2023). This lower rate can be attributed to the fragmented ECEC systems across different states and the generally lower public investment. The lower investment notably impacts low-income families' access to affordable, high-quality ECEC, perpetuating economic disparities and affecting women's ability to participate in the labor market fully.

Despite these challenges, the US has shown signs of progress. Initiatives such as PFA and the establishment of free or subsidized preschool programs in 13 states demonstrate an effort to expand access to early education. These efforts are crucial as they not only aim to increase enrollment rates but also seek to address the broader issues of gender inequality in the labor market by enabling more women to balance work and family commitments effectively.

Potential for Policy Reform

An increase in public investment in ECEC, as proposed, could substantially raise the enrollment rates closer to the OECD average or beyond. This is particularly significant as higher enrollment rates in ECEC are associated with greater female labor force participation, reduced gender pay gaps, and more balanced economic development. This is a forward step in recognizing the profound impact that early childhood education can have on societal equity and labor market dynamics.

Methodological Comparison

There are a few main ways that researchers have examined the impact of preschool/early childhood education programs on gender equality in labor market outcomes: survey data,

administrative data, qualitative & mixed methods, and quasi-experimental designs, each offering unique insights and challenges.

Survey Data

Survey data provides individual-level insights into family dynamics, employment patterns, and childcare usage, essential for understanding the nuanced impacts of early childhood education on labor market outcomes. Notably, the Current Population Survey (CPS) and the American Time Use Survey (ATUS) offer valuable data for longitudinal and cross-sectional studies, allowing researchers to observe trends and changes over time. However, these surveys rely on self-reported data, which can introduce bias and may not comprehensively capture the range of policy impacts. Despite these limitations, survey data remains a cornerstone for empirical analysis in this field.

One example*, T*he National Institute for Early Education Research (NIEER)*,* conducts an annual survey of state-funded preschool programs in the United States, providing a rich dataset that details enrollment trends, funding allocations, quality standards, and other programmatic features. Studies leveraging this data have been instrumental in establishing the link between preschool access, program quality, and subsequent labor force outcomes, particularly highlighting the critical role of preschool availability in shaping maternal employment patterns.

Administrative Data

Administrative data, often derived from tax records and social service databases, offers more accurate information about program participation, and facilitates detailed tracking over time. This data is particularly valuable for assessing the uptake and outcomes of childcare subsidies and other related social programs. For instance, Berlinski et al. (2011) utilize administrative data to explore the intricacies of California's PFA initiative, demonstrating

significant positive impacts on maternal labor supply, especially benefiting families in disadvantaged circumstances.

Despite its advantages, administrative data is limited in scope, focusing predominantly on populations that engage with specific programs, and may exclude relevant social and behavioral variables. Expanding the datasets to include more comprehensive variables could potentially provide a more holistic view of the impacts of ECEC policies.

Quasi-Experimental Designs

To infer causality, many researchers use quasi-experimental designs, such as Difference-in-Differences (DiD) and Instrumental Variables (IV) approaches. These methods take advantage of natural experiments or policy changes to estimate the effects of ECEC policies. For example, a DiD approach may compare labor market outcomes before and after the implementation of a childcare policy within treatment and control groups. While powerful for causal inference, the validity of these designs depends heavily on the assumption that the policy change is exogenous and that comparable trends exist between groups in the absence of the policy.

Berthelon, Kruger, and Oyarzun (2015) adopted a quasi-experimental difference-in-differences approach to assess the ramifications of extending school days in Chile, including preschool, on maternal labor force participation. Their findings reveal that transitioning to full-day school programs has the potential to significantly enhance female labor force participation, with an increase of 11.2 percentage points.

Gaps in Research

Currently, researchers focus has been on the children who attend preschool themselves rather than overall economic impact on families. On one side of the debate, studies such as Berlinski et al. (2008, 2011) found that preschool programs, specifically California's PFA

initiative, significantly increased maternal employment, especially among disadvantaged families. This suggests that providing universal preschool can be an effective policy tool for enhancing women's labor market outcomes.

The lack in conclusive results may be attributed to several factors, including but not limited to, the design of the preschool program, cultural norms regarding gender roles, the availability and quality of the programs, and the economic context of the regions being studied. For instance, variations in program accessibility, affordability, and alignment with labor market demands can influence the effectiveness of these policies in supporting maternal employment.

While there has been considerable research on the economic outcomes associated with ECEC mentioned above, less attention has been given to broader socioeconomic indicators such as poverty and the impact of ECEC on women's labor market participation and gender equality in the labor market. This study aims to fill this gap by not only analyzing traditional labor market indicators but also by examining the influence of preschool programs on poverty levels among women in the labor force. Much of the research on the impacts of preschool programs, particularly within the European context, leverages natural experiments that affect the entire population, such as major expansions to subsidized, high-quality care. This approach benefits from uniform policy changes that facilitate clear analyses. In contrast, the American landscape presents complexities due to variability in state-level implementations and demographic diversity. Works like Herbst (2018) address the piecemeal nature of American childcare policies and their varied impacts on economic outcomes. Yet, there remains research that combines the analysis of economic indicators with poverty measures.

This research gap is particularly important given the growing recognition of the role that ECEC policies can play in balancing the labor market gender balance. By extending beyond

labor market participation and wages, and including poverty status as a key outcome, this study contributes to a more holistic understanding of the role that preschool programs play in economic wellbeing. Addressing these gaps is not only interesting to me but is also crucial for policymakers and practitioners. A better understanding of the effects of ECEC policies can inform the design and implementation of programs that aim to improve both labor market outcomes and overall economic security for families.

Empirical Methods

In my study, I assess the impact of the PFA policy using a difference-in-differences (DiD) approach. I chose DiD because it is particularly effective for analyzing policy interventions that are implemented in some states but not others. This method is renowned for its strength in addressing causality, controlling for confounding variables, and its flexibility in application, making it a common choice among researchers (Imbens, 2009).

Difference-in Differences-Methodology

DiD provides a valuable framework for evaluating the effects of specific policies using observational data. Unlike randomized experiments, DiD utilizes existing groups and compares changes over time between those affected by the policy (the treatment group) and those that are not (the control group). This approach is based on creating a counterfactual scenario to estimate what the outcome for the treatment group would have been had they not received the intervention (Abadie, 2005).

I leverage this methodology to isolate the effect of the policy by comparing the before-and-after changes in outcomes in the treatment group against the control group. This helps control for external factors that might affect both groups similarly over time, ensuring a clearer picture of the policy's impact.

Underlying Assumptions

The validity of my DiD analysis hinges on the parallel trends assumption, and the accuracy of the data measurement. If either assumption is violated, it can lead to biased estimates of the treatment effect and in turn mast the true effect of the intervention and/or lead to misleading conclusions.

The parallel trends assumption requires that trends in the outcome variable for the treatment and control groups would have been parallel over time if the intervention had not occurred. This allows researchers to attribute any difference in trends observed after the intervention to the intervention itself (Lechner, 2010).

A general assumption in most statistical analysis is having no measurement errors. It implies that the data collected on the outcome variable is accurate and free of systematic errors. Measurement errors can introduce noise into the analysis, making it difficult to distinguish the true effect of the intervention from random fluctuations in the data.

Threats to Identification

One key concern is selection bias. The control group, which supposedly represents the scenario without the policy change, might not be perfectly comparable to the treatment group that receives the policy. This can happen if individuals self-select into the treatment group, meaning they choose to participate for reasons unrelated to the policy itself (Lechner, 2010). This can make it difficult to isolate the true effect of the policy, as the observed changes might be due to pre-existing differences between the groups rather than the policy itself.

Another limitation of DiD is the potential for pre-existing trends. If the outcome variable was already showing different trends in the treatment and control groups before the policy was implemented, DID might misinterpret those trends as being caused by the policy (Athey, 2006). This can lead to misleading conclusions about the policy's effectiveness.

Data

Data Source

My research uses current populated survey (CPS) data for social, economic and health research from the Integrated Public Use Microdata Series (IPUMS) as the primary data source (Ruggles, Flood, et. al, 2024). This database provides access to high-quality microdata from various censuses and surveys across numerous countries and time periods. This aggregation ensures consistency in variable definitions and coding across samples, enabling meaningful comparisons over time and space. Additionally, IPUMS offers extensive documentation and user-friendly tools for data extraction and analysis, streamlining the research process. The ability to select specific variables and samples further enhances the precision and focus of the analysis, allowing us to zero in on the most relevant data for my research question.

Estimation Strategy

To investigate the impact of childcare policies on labor market outcomes, I created a set of regression models incorporating interaction terms to examine potential differential effects across racial groups. The primary analysis focuses on estimating the causal effects of these policies using the following regression model:

$$Y = \beta_1 Policy_{st} + \beta_2 X_i + \mu_s + \nu_t + \varepsilon_{ist}$$

Here, Y represents the outcome variables (such as women's labor force participation; overall wage and salary; hours worked; hourly wage; and poverty status). i refers to the individual level, s to state, t to year. $Polity_{st}$ indicates the presence of a childcare policy within state each year. The variable X_i includes categorical variables reflecting both the individual's age and racial identity, with White serving as the reference group in our analysis. This allows us to

measure the differential impacts on other racial groups in comparison to White individuals, who typically represent the majority group in many labor market analyses.

I processed the data using R, using the 'feols' function from the 'fixest' package to run fixed effects linear models. This approach controls for both time-invariant characteristics and state-specific unobservable factors. To ensure a successful inference, I also corrected for within-state serial correlation by clustering standard errors by state.

The data included in my regression equations are filtered to consider only women aged 16-45, representative of the typical childbearing age, who have at least one child under five. This focus ensures that the analysis remains relevant to the primary beneficiaries of PFA policies. Overall, the key variables in my analysis include:

- Demographic Variables: Age, sex, race, and marital status to control for potential confounding factors.

- Child-related Variables: Having at least one child under 5, crucial for analyzing the direct beneficiaries of preschool policies.

- Labor Market Outcomes: Labor force participation, hours worked weekly, poverty status, hourly wage, and wage and salary income, which help in assessing the economic impact of the policy.

The output event study graphs I used to analyze PFA's impact on the labor market are confined to five years pre policy and five years after implementation to ensure that all states are included in the analysis rather than states dropping out of the comparison group simply because they haven't been implemented for as long.

Results – Diff-in-Diff Regression Analysis

The following sections provide a deeper analysis into each outcome variable using event study analysis highlight the policy's effects, providing insights into how quickly and significantly the policy influences various aspects of economic behavior among women.

	Labor Force Participation	Wage & Salary Income	Hourly Wages	Weekly Working Hours	Poverty Status
Coefficient	1.2 percentage points	$847.75	$0.53	.12 hours	-1.3 percentage points
(SE)	.4	$562.70	$0.66	.161	.005
P-value	p <.001 **	p = .14	p = .43	p =.47	p = .006**
Adjusted R2	0.02	0.08	0.27	0.02	0.08

Table 1: Impact of Preschool for All Policies on Women's Labor Market Outcomes and Economic Inequality (Regression Analysis)

This table presents the results of a regression analysis assessing the impact of universal preschool policies on various labor market outcomes for women, including labor force participation, wage and salary income, hourly wages, weekly working hours, and poverty status. The coefficients, expressed in percentage points or dollar amounts, indicate the estimated effect of the policy on each outcome. Standard errors (SE) provide a measure of the precision of these estimates, while p-values indicate the statistical significance of the results. Adjusted R-squared values show the proportion of variance explained by the model for each outcome.

The data above indicates that the PFA policy has a statistically significant impact on labor force participation and poverty reduction, highlighting its potential effectiveness as a tool to enhance economic stability for women. However, the effects on wage and salary income, hourly wages, and weekly working hours are not statistically significant, suggesting that while the policy might aid in increasing employment and reducing poverty, its influence on income and hours worked is less certain.

Each figure illustrates the effect of the PFA policy on women's labor force outcomes. The x-axis represents the years relative to policy implementation, with the policy enactment marked by the vertical dashed line at year one before the policy. The y-axis shows the estimated effect size along with the 95% confidence intervals.

Impact of Preschool for All on Women's Labor Force Participation

In order look at the impact of policies being implemented on women's labor force participation, I looked at the following regression equation mentioned above with Labor Force Participation as a binary outcome. Being in the labor force is defined either an individual working or seeking to work.
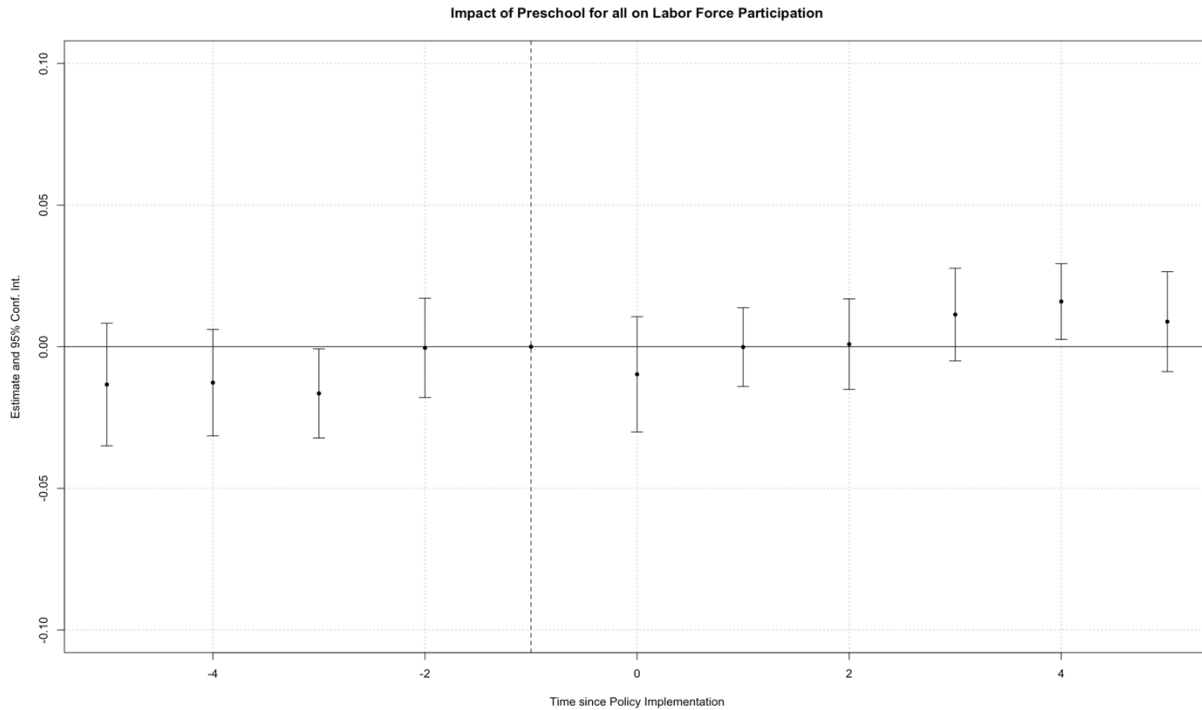

Figure 2: Impact of Preschool for All on Labor Force Participation

The positive and statistically significant policy coefficient .012 indicates that the PFA policy leads to an increase of approximately 1.2 percentage points in labor force participation

among women. This effect is statistically significant suggesting a strong correlation between the policy and increased labor force participation.

The pre-policy period in the graph does not exhibit any significant trends as it hovers around zero throughout the observed period, which supports the assumption of parallel trends necessary for a difference-in-differences analysis. This suggests that the states, whether they implemented the policy or not, were comparable. In fact, those states typically had lower labor force participation rates prior to implementing 'Preschool for All' (PFA). Therefore, we can attribute the post-policy changes in labor force participation to the introduction of this program.

Post PFA, the effects appear stable over time without significant increases or decreases in the impact, which suggests that the initial effects of the policy were maintained. There is no evidence from the graph of growing or diminishing effects, indicating that the policy's impact was immediate and sustained for at least five years post implementing PFA.

Impact of Preschool for All on Women's Overall Wage and Salary Income

The regression equation is based on the one mentioned above with Overall Annual Wage and Salary income as a monetary outcome. Responses to the current population survey reported their income and the Census Bureau applied disclosure identification of individuals and coded accordingly.
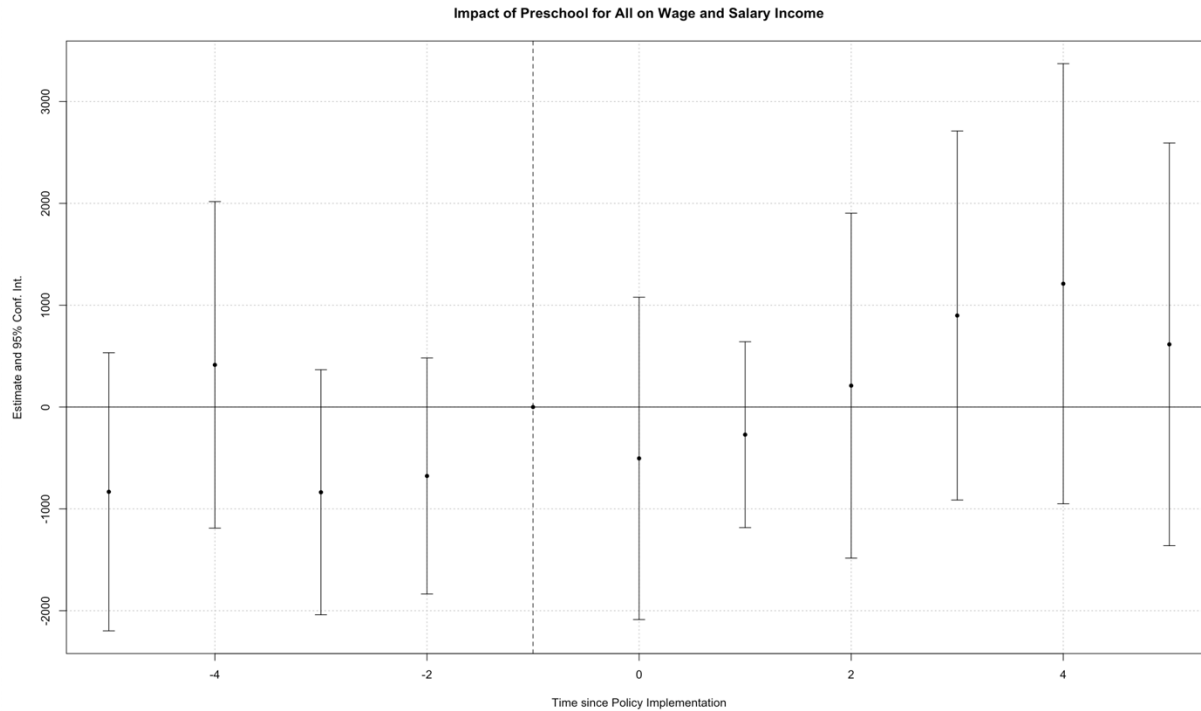
Figure 3: Impact of Preschool for All on Wage and Salary Income

The coefficient in Table 1 suggests an increase of approximately $847.75 in wage and salary income attributable to the policy. This potential increase could reflect improved labor market outcomes for women, possibly due to increased availability of childcare allowing for greater workforce participation and productivity. However, given the wide confidence intervals and lack of statistical significance, these conclusions should be interpreted cautiously. Additionally, the adjusted R-squared value of 0.08 indicates that the model explains 8% of the variation in wage and salary income, suggesting that other factors not included in the model might play significant roles.

The graph shows a relatively flat trend before the policy implementation (time ≤ 0), indicating that the treatment and control groups were comparable prior to the policy. This suggests no significant pre-existing differences in wage and salary income growth between the two groups.

After the policy implementation, there is a visible but not statistically significant upward trend in wage and salary income. While the point estimates suggest an increase in income, the confidence intervals are wide and overlap zero, indicating a lack of statistical significance. This implies that, while there might be an increase in wage and salary income, the evidence is not strong enough to conclusively attribute this effect to the policy.

Impact of Preschool for All on Women's Weekly Hours Worked

To find the impact, I used the regression equation mentioned above with women's weekly hours worked as my outcome variable. This indicator reports the number of hours per week respondents typically worked the previous calendar year. Individuals were asked if they worked at all the previous year, and then asked if they had variable work such as temporary or seasonal work.
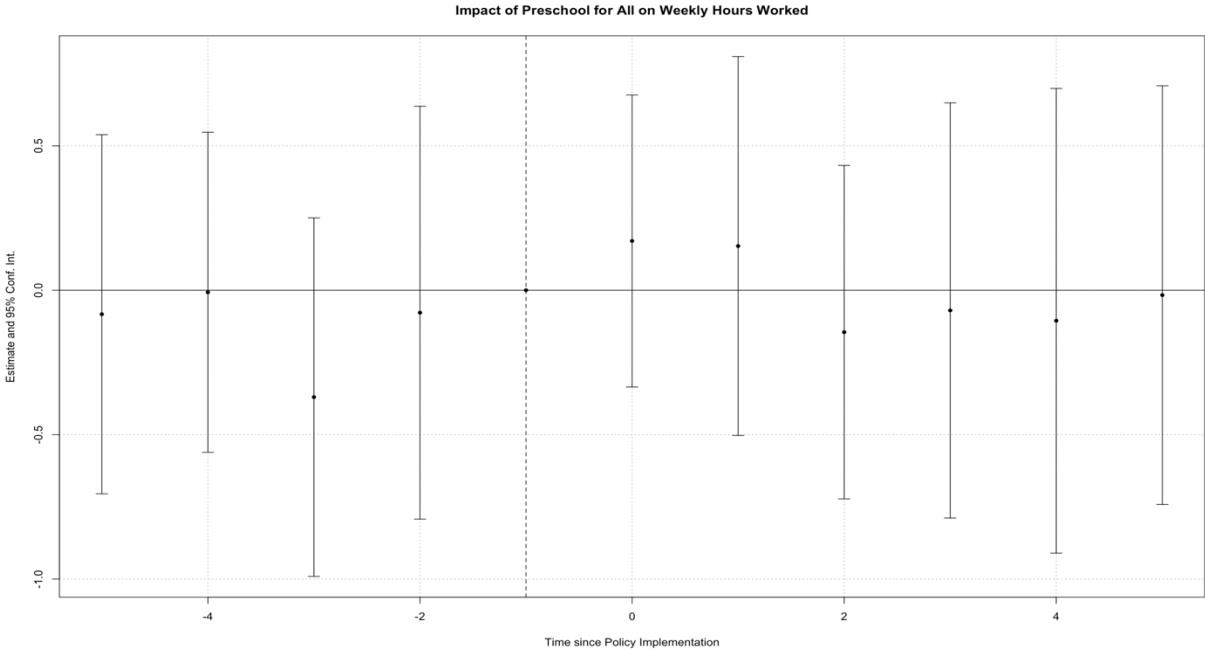

Figure 4: Impact of Preschool for All on Weekly Hours Worked

The regression analysis examining the effect of the PFA policy on women's weekly hours worked has a coefficient estimate of 0.117, showing a slight increase in weekly working hours.

However, this effect is not statistically significant. The model's adjusted R-squared value of 0.020 suggests that only a small proportion of the variability in weekly hours worked is explained by the model.

The pre-treatment trends appear relatively flat and close to zero, indicating that states with the policy were comparable to those without it before the policy was implemented. This suggests a valid parallel trends assumption for the difference-in-differences approach.

Post-treatment, the estimates show a slight increase in weekly hours worked, but the effects remain close to zero and, as mentioned earlier, are not statistically significant. The confidence intervals are wide, encompassing both positive and negative values, showing both variability and a lack of precision in the estimates.

Additionally, the potential for mothers on the margin entering the labor market and others shifting from full-time to part-time roles might contribute to the observed variability and lack of clear trends.

Impact of Preschool for All on Women's Hourly Wage

The regression analysis is based on the regression equation mentioned above with women's hourly wage as the outcome variable. The amounts respondents gave were adjusted for inflation using the Consumer Price Index (CPI) factors to allow it to be comparable over time.
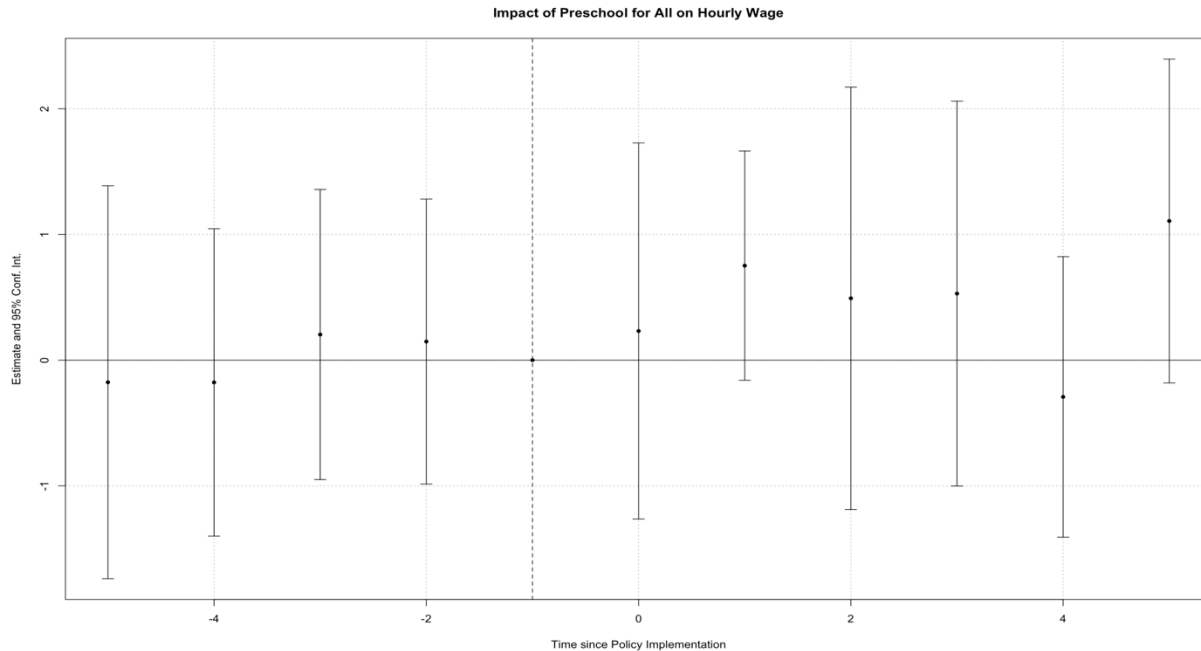
Figure 5: Impact of Preschool for All on Hourly Wage

The coefficient for the policy is 0.527, which translates to an increase of approximately 53 cents. However, the analysis suggests that the PFA policy did not significantly impact women's hourly wages. The flat pre-treatment trends confirm the comparability of treated and control states, and the lack of significant post-treatment changes indicates that the policy did not influence hourly wages.

The pre-treatment estimates are close to zero, suggesting no significant differences in hourly wages between states with and without the policy before its implementation. This implies that the treated and control groups were comparable before the policy.

Post-policy, the estimates remain near zero, with overlapping confidence intervals. This indicates no significant change in hourly wages attributable to the policy over time.

Future research should explore these unobserved factors more thoroughly, possibly employing methodologies like synthetic control or propensity score matching to better isolate the

effect of the preschool policy. Additionally, considering more granular data, such as industry-specific trends or regional economic conditions, could enhance the model's accuracy.

Impact of Preschool for All on Women's Poverty Status

The regression analysis is based on the equation mentioned above with women's poverty status as the outcome variable. This is an interval variable and is created by comparing the census family's total income from the previous calendar year and uses the definition of poverty originally developed in 1964 by the Social Security Administration. I took the interval data and made it a binary yes or no.
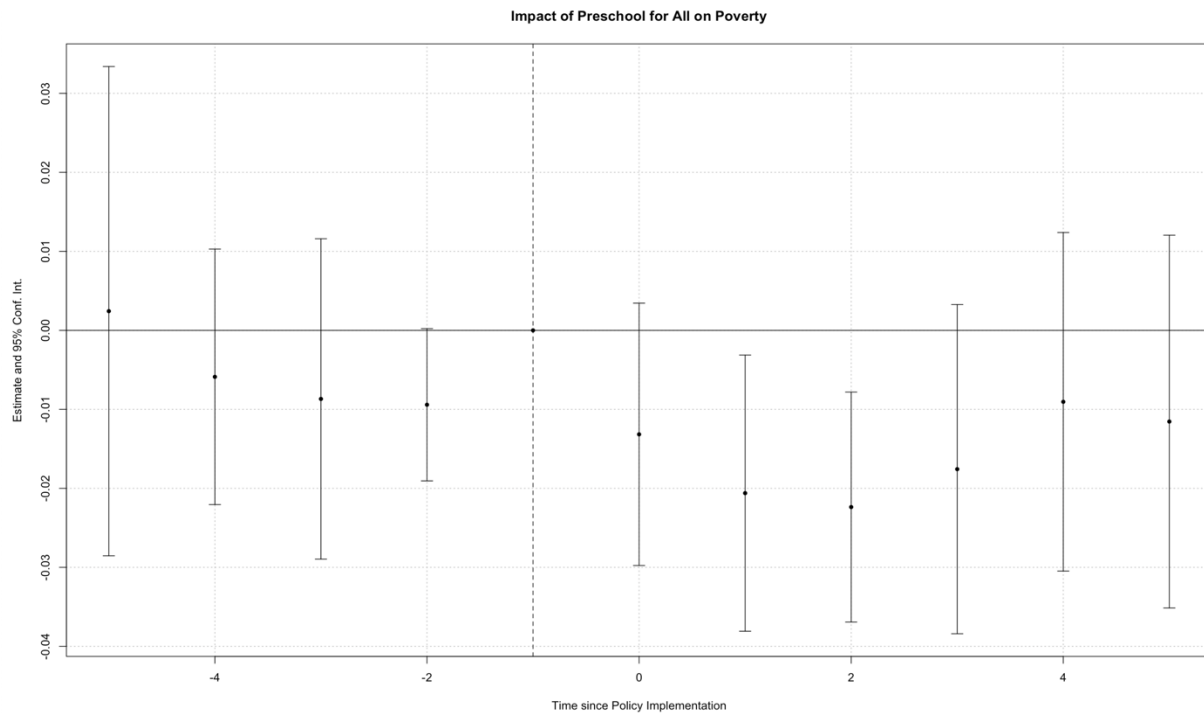

Figure 6: Impact of Preschool for All on Poverty Status

The impact of the preschool policy on women's poverty status indicates a significant reduction in poverty. The policy coefficient shows a statistically significant decrease of 1.3 percentage points, suggesting that the policy has a measurable impact on reducing poverty

among women. The adjusted R-squared value of 0.0801 indicates that the model explains a modest proportion of the variation in women's poverty status.

The pre-policy period does not show significant pre-trends, suggesting that states with and without the policy were comparable before its implementation, which further strengthens the validity of attributing post-policy differences to the policy itself.

After the policy implementation, the graph indicates a consistent decrease in poverty rates among women. The effect size becomes more pronounced over time, showing a clear downward trend in poverty status, which supports the regression results.

The significant decrease in poverty status among women in states implementing the PFA policy suggests that access to free or subsidized preschool can play an important role in improving economic outcomes for families. This potential decrease could reflect improved labor market outcomes for women, due to increased availability of childcare allowing for greater workforce participation and productivity.

Discussion and Conclusion

Discussion

My analysis of the PFA policy's impact on various labor market outcomes for women reveals a mostly positive effect on promoting greater economic empowerment and gender equality in the workforce.

Taken together, the statistically significant increases in women's labor force participation rates (1.2 percentage points) and reductions in poverty status (1.3 percentage points) represent two of the most compelling findings. This provides evidence that improving access to affordable, high-quality preschool can effectively remove key barriers to women's employment and financial stability. By alleviating the childcare burden, the policy enables more women to enter and remain in the labor force, while also lifting many out of poverty through increased earnings potential.

While the impacts on wage and salary income ($847.75 increase) and hourly wages (5.3 percentage point increase) were not statistically significant, the observed positive trends suggest that preschool access may contribute to higher earnings and better-paying job opportunities for women over time. As women gain more consistent labor force attachment and face fewer career interruptions due to childcare responsibilities, their bargaining power and ability to pursue advancement could gradually improve.

By addressing the disproportionate burden of childcare that has historically hindered women's economic opportunities, such initiatives can empower women to fully participate in the workforce, increase their earnings potential, and achieve greater financial independence and stability.

In conclusion, the implementation of a universal PFA policy represents a powerful policy lever for advancing women's labor market outcomes and promoting inclusive economic growth.

By addressing a fundamental barrier to gender equality, such initiatives can unlock the full potential of women's contributions to the workforce, benefiting not only individual families but also society.

Future Research

While the findings from this study provide valuable insights into the impacts of a PFA policy on women's labor market outcomes, several areas warrant further exploration to deepen our understanding and inform policy. Moving forward, it's crucial to explore how intersecting identities such as socio-economic status, education level, or disability impact the effectiveness of these policies. An intersectional analysis could provide more detailed insights into which subgroups benefit most and which may be inadvertently left behind, ensuring that future policies are more inclusive and equitable.

Future studies might also explore the structural aspects of the labor market that influence the efficacy of childcare policies, such as the availability of part-time work, the flexibility of work schedules, and the presence of career advancement opportunities for part-time employees. Understanding these dynamics will be crucial for designing policies that not only facilitate labor market participation but also promote sustainable economic advancement for all women.

Exploring the interactions between preschool policies and other family-friendly initiatives, such as paid parental leave, flexible work arrangements, and workplace accommodations, could yield valuable insights. A comprehensive policy ecosystem that supports women's diverse needs at various life stages may be necessary to maximize the positive impacts on labor market outcomes and economic empowerment. Often, parental leave is utilized more by mothers than fathers, potentially widening the gender gap unless policies such as Sweden's

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"Daddy leave" are implemented to balance the division of childcare and housework, thereby promoting greater equality in the labor market (Almqvist & Duvander, 2014).

Furthermore, comparative research could examine the effects of the lack of a federal paid parental leave mandate in the United States, along with the varied state policies, on labor market dynamics and women's labor equality over the long term, rather than focusing solely on policies affecting parents with preschool-aged children.

Finally, it would be extremely beneficial to longitudinally monitor the career trajectories, earnings growth, and work-life balance of women over extended periods following the implementation of the 'Preschool for All' (PFA) program. Examining how the impacts evolve as children age and women progress in their careers could reveal important benefits and drawbacks. Conducting a cost-benefit analysis to consider these long-term returns on investment, accounting for factors such as increased tax, reduced reliance on social safety nets, and overall wellbeing of policy maker's communities.

Final Thoughts

The PFA initiative represents a significant step forward in supporting women, particularly in balancing work and family responsibilities. While the policy fosters positive trends in labor force metrics, it also reveals underlying inequities that prevent certain groups from fully benefiting from these initiatives. Continuous evolution and adaptation of policies will be essential to ensure that the benefits of universal preschool reach every corner of the labor market.

Appendix

Appendix 1: Employment Rates by Gender
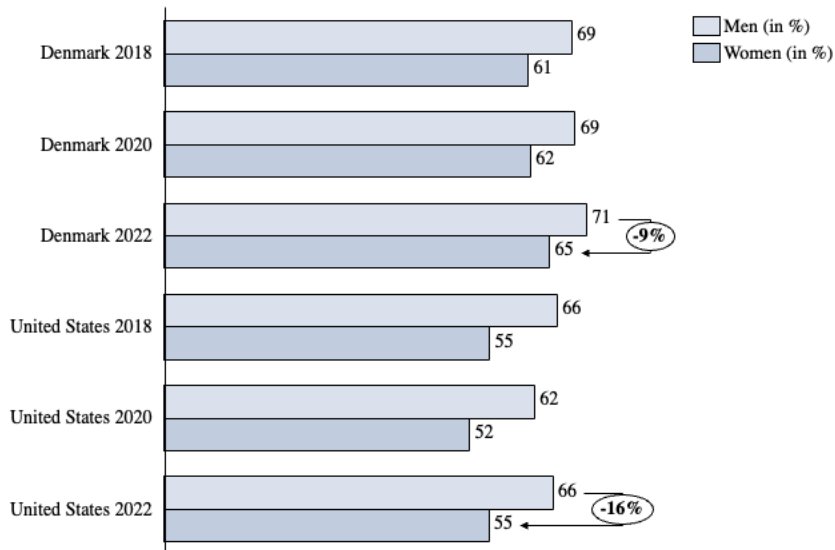
Appendix 2: Impact of Preschool for All on Men's Labor Market Statistics

	Labor Force Participation	Wage & Salary Income	Hourly Wages	Weekly Working Hours	Poverty Status
Coefficient	-.53 percentage points	-$275.50	$0.38	-.04 hours	-.06 percentage points
(SE)	.0035	$847.13	..42	.14	.005
P-value	p =.14	p = .74	p = .36	p =.75	p = .9
Adjusted R2	0.02	0.1	0.24	0.02	0.03

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