New Mexico Prekindergarten and its Short-Term Effects on County-Level Female Employment and Child Maltreatment

Kira M. Villa (corresponding author)

Associate Professor, Department of Economics

University of New Mexico

Abhradeep Karmakar

Graduate Student, Department of Economics

University of New Mexico

Kritika Sen

Graduate Student, Department of Economics

University of New Mexico

August 17, 2022

Acknowledgements: The authors would like to acknowledge funding from the NM Legislature (SB 377 - junior appropriations bill). The opinions expressed in this paper are solely of the authors. All errors are our own.

Keywords: Prekindergarten, Female Labor Market Participation, Child Maltreatment, Early Childhood

DEPARTMENT OF ECONOMICS

Executive Summary

A wide body of evidence demonstrates that participation in quality preschool improves short- and long-term well-being across a wide range of educational, labor, and socio-economic dimensions. In response, New Mexico initiated it's own state-supported half-day prekindergarten program for the state's 4-year-olds in 2005. Since then, the state has dramatically expanded this program and now o ers extended-day programs as well as early prekindergarten for 3-year olds. Consequently, the state is now one of the nation's leaders in preschool access ranking 10th in the nation in state support for preschool and 13th and 11th in 4- and 3-year-old access to preschool.

The paper is a part of a larger project evaluating the association between New Mexico's early childhood programs and county-level economic, educational, and child well-being. In the paper, we examine the near-term association between state prekindergarten support and county-level rates of female labor market participation and child maltreatment. We nd that increasing county-level prekindergarten funding by $1 per capita is associated with an increase of the county employment rate for women with children under age 6 by 0.35% on average, with larger e ects at lower levels of absolute per capita funding. Each additional dollar per capita is also associated with a reduction in the county child victimization rate by 0.10 of a child per 1000, on average. The e ects on child victimization increase with funding levels, with larger reductions in child victimization at higher levels of per capita prekindergarten funding.

Evidence from the National Institute for Early Education Research (NIEER) and the New Mexico Legislative Finance Committee (LFC) demonstrate that New Mexico's prekindergarten program is associated with improved school readiness upon entry into kindergarten and higher math and reading pro ciency levels in third grade. Estimates on the rate of return for early childhood education bene ts range from 6%-13%.

This project contributes to the evidence provided by the NIEER and LFC in a few ways. First, by examining prekindergarten support and associated outcomes at the county-level, we are able to demonstrate that the bene ts of state prekindergarten can be observed not only for individual participating families and children, but also at the greater community-level. This is encouraging news from a policy perspective as it suggests that this program likely serves the interests of the state as a whole and not just individual bene ciaries.

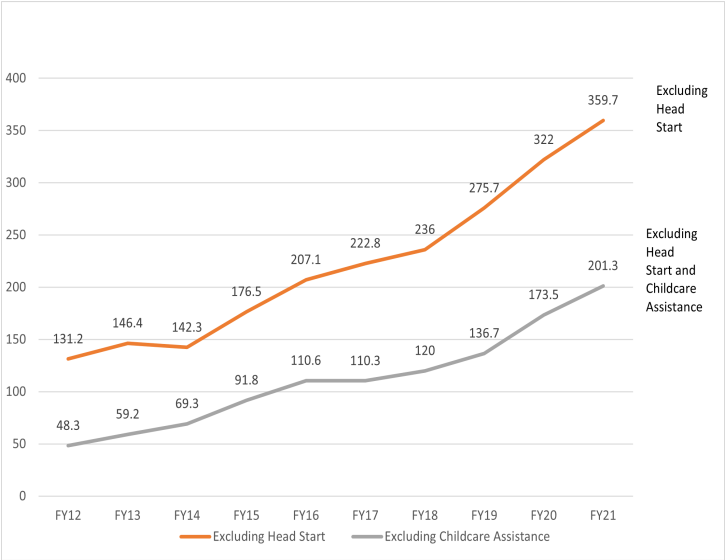
Second, female labor force participation and child maltreatment are not speci cally targeted objectives of prekindergarten programs. Therefore, our ndings suggest that New Mexico prekindergarten (and probably other correlated early childhood programs) has positive spillover e ects on other aspects of well-being. This suggests that the rate of return for these programs are likely higher than previously thought.

1 Introduction

A wide body of compelling research demonstrates that quality preschool (along with other early childhood interventions) leads not only to improved school readiness but also a broad-range of positive long-term adult outcomes including but not limited to improved education, employment outcomes, skill formation (e.g., cognitive ability), and health as well as reduced crime participation.[1]

In response to this evidence, the New Mexico state dramatically increased funding for early childhood programs over the past decade, even as revenue shortfalls led to at or declining spending in virtually all other areas (LFC Post-Session Reviews, 2014-2021[2]).Total state resources available for early childhood funding, excluding the federally funded Head Start and Early Head Start programs, almost tripled between FY2012 and FY2021, from$131.2 million to $359.7 million (See Figure 1).

Figure 1: Total Spending (millions of dollars) on Early Childhood Programs in New Mexico, FY2012{2021



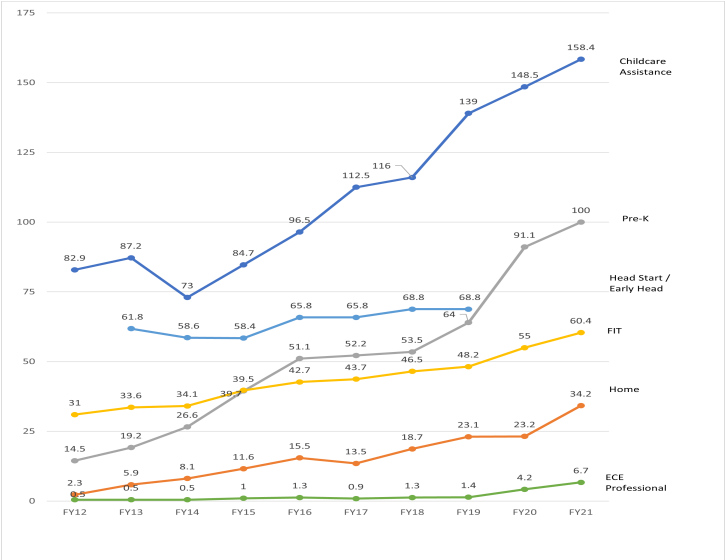
Source: New Mexico Legislative Finance Committee Post-Session Reports

Spending on prekindergarten, one of the early childhood programs with the best evidence base (along with Home Visiting), increased almost seven-fold over this period, from$14.5 million in FY2012 to $100 million in FY2021 (See Figure 2). Numbers of children enrolled in prekindergarten also almost tripled from approximately 4,500 3- and 4-year-olds to over 12,000.

[1] For example, Currie and Thomas [2000], Barnett and Masse [2007], Garcia et al. [2020], Heckman et al. [2006], Heckman and Masterov [2007], Heckman et al. [2010], and Rolnick and Grunewald [2008].

[2] https://www.nmlegis.gov/entity/lfc/Session_Publications

Figure 2: Spending (in millions) on Early Childhood Programs in New Mexico, FY2012{ FY2021, by Program



Note: The Childcare Assistance and Home Visiting programs rely on a combination of federal and state funding. All other programs rely solely on state funding. FIT is the Family Infant Toddler program, which provides early childhood services mandated by the federal Individuals with Disabilities Education Act.

Source: New Mexico Legislative Finance Committee Post-Session Reports.

The educational bene ts of New Mexico's prekindergarten program to child learning outcomes has been demonstrated by both the National Institute for Early Education Research (NIEER) and the New Mexico Legislative Finance Committee (LFC). Research out of both organizations demonstrate that participation in the state's prekindergarten program is associated with improved math and reading pro ciency levels upon entry into kindergarten and in third grade ([Hustedt et al., 2007, 2021, Legislative Finance Committee (LFC), 2018]).

However, the bene ts to New Mexico's prekindergarten programs are likely not limited its medium-term impact on individual child learning outcomes. Given its intersection with the childcare infrastructure, there are likely other unintended, more immediate bene ts of preschool expansion for New Mexico's families and economy. More accessible and a ordable preschool can enhance female labor force participation by reducing barriers to employment. Greater prekindergarten participation also provides more opportunities for childcare workers (and mandatory reporters) to intersect with young children before they start school, which can reduce levels of child maltreatment in the immediate term.

As prekindergarten participation increases within a community, there are also likely multiplicative bene ts to the county at large. For example, more women in the labor force is associated with improved overall economic opportunities and growth. Also, higher levels of participation likely result in peer e ects on both child outcomes and parental behaviors and norms. In other words, prekindergarten may not only a ect these characteristics in participating families, but also in families within their peer network who are not themselves sending their children to prekindergarten.

In this paper, we examine the correlation between county-level prekindergarten state funding and female labor force participation and child maltreatment indicators. We nd that higher levels state-provided prekindergarten is associated with lower rates of child maltreatment and

higher rates of employment for women with young children. By examining county-level correlations we are able to demonstrate that the bene ts of expanded state-provided prekindergarten can be observed not only at the level of the individual child participant but also at the community-level in the counties they live in.

Our ndings are encouraging, however, it is important to note that funding to New Mexico's Childcare Assistance (CCA) program was expanding at similar rates as that to prekindergarten over the same period. CCA comprises the largest share of New Mexico's budget allocated to early childhood interventions (followed by prekindergarten). It is therefore possible that some of the poistive correlations we nd related to prekindergarten might be at least partly attributable to CCA provisions. We are currently working on obtaining county-level CCA data and longer historical data, both of which will allow us to better disentangle the e ects of these two programs.

Regardless, both programs are important parts of New Mexico's early childhood programming and our ndings suggest that this programming may yield important bene ts to female employment and child welfare.

2 State Prekindergarten in New Mexico

New Mexico's state prekindergarten is the state's early education program for 3- and 4-year-olds. It started in the 2005/06 school year after the enactment of of the 2005 Pre-Kindergarten Act. Although there is no household income requirement for prekindergarten eligibility, funding for state prekindergarten is awarded through a competitive grant process with preference given to programs in Title I elementary school attendance zones ([Early Childhood Education & Care Department, 2022])[3].

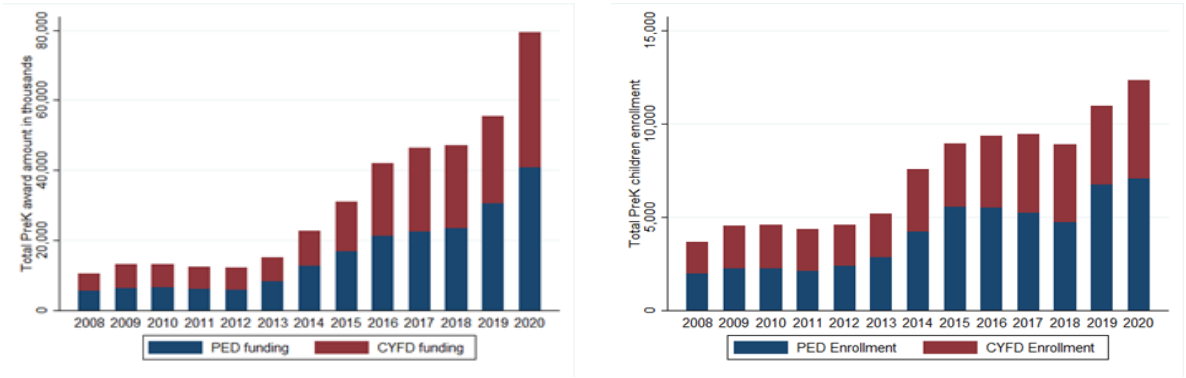
Since its enactment, New Mexico prekindergarten has been administered by the Public Education Department (PED) and Children, Youth, and Families Department (CYFD). With the 2019 New Mexico Early Education Act, all state prekindergarten is overseen by the newly created Early Childhood Education and Care Department (ECECD), although it is still currently administered by PED and CYFD.

Due to the strong evidence on the long-term bene ts of early childhood interventions and the demonstrated bene ts to child learning outcomes in New Mexico, the state substantially ramped up its early childhood programming over the last decade and a half|particularly in childcare assistance and prekindergarten (See Figure 2). Among its programs, Pre-K receives the second largest portion of New Mexico's budget allocated to early childhood programming ($100 million in FY2021). New Mexico prekindergarten has witnessed particularly signi cant increases in funding and participation since 2014/15 (see Figure 3[4]).

[3] Title I schools are those with high rates of low-income students

[4] It is worth noting that extended prekindergarten programs became available in the state in 2015.

Figure 3: New Mexico Prekindergarten funding and participation levels exhibit substantial increases over time and across programs



Prekindergarten is now o ered in 88% of the state's school districts. NIEER ranked New Mexico among 10 states that are within striking distance of serving at least 70% of their entire 4 year-old population ([Freidman-Krauss et al., 2022]).

Consequently, despite ranking low on many economic and child indicators, New Mexico now ranks among the top third of states in the U.S. in state-funded preschool indicators. It ranks 13th in the nation in preschool access to 4-year-olds; 11th in access for 3-year-olds; and 10th in provided resources based on state-spending.

New Mexico currently ranks in the top third states or better for prekindergarten enrollment. In the 2016-2017 school year, 55% of 4-year-olds and 22% of 3-year-olds attended state-funded prekindergarten or federally funded Head Start in New Mexico, compared with the national average state enrollments of 33% and 5%. These gures put New Mexico at 15th out of all states for 4-year-old enrollment and 18th for 3-year-olds ([Freidman-Krauss et al., 2022]).

3 Data

This paper is a part of the \Early Childhood Interventions in New Mexico: Short- and Medium-term Outcomes" project, one component of which entails compiling comprehensive and rich community-level longitudinal data on a decade or more's worth of New Mexico data on state early childhood programming and child and adolescent well being. We have obtained data from multiple sources including: the New Mexico Legislative Finance Committee (LFC) reports, the Public Education Department (PED) prekindergarten reporting; Children, Youth, & Families Department (CYFD) prekindergarten reporting, CYFD protective services; the the Stanford Education Data Archive (SEDA); New Mexico's Health Indicator Data & Statistics (IBIS); and the American Community Survey (ACS).

For this paper, we focus on data containing county-level information on prekindergarten programming, labor market participation, and child welfare indicators. Speci cally, we employ data on county-level prekindergarten funding for each year from 2008 to 2020.[5] The year 2008 is currently the earliest year we have for prekindergarten data.[6] Then using county population data from the Geospatial and Population Studies and the University of New Mexico[7], we

[5] We would like to thank the LFC for providing initial data on county-level prekindergarten funding across years. We would especially like to thank Jon Courtney and Jacob Rowberry at the LFC for their help in obtaining these data.

[6] We hope to obtain historical data for the years 2005{2007, which will enable us to extend our analysis.

[7] https://gps.unm.edu/

compute levels of per capita state funding for prekindergarten for each county and each year. It is worth noting that this variable excludes funding to head start, which is federally funded and also not a part of our analysis.

For our female labor force participation analysis we use employment data from the ACS based on ve-year moving averages. Speci cally, we focus on county-level female employment rates for women with children under the age of six as one of our main variables of interest. We also use county-level data on total male and female employment rates.

Our other main variables of interest relate to reported levels of county-level child maltreatment including, child victimization rates per 1000, total annual reports of child abuse and neglect, and the percent of total reports accepted for further investigation. We extracted child maltreatment variables from the \360 Annual Reports" produced by CYFD Protective Services.

Our models also control for county-speci c characteristics including percent of women married, widowed or never married, and the proportion of the county population who's highest grade attainment was below high school, high school diploma, or a college degree. County control variables are also based on ve year moving averages from ACS.

4 Methods

For our analysis, we exploit variation in per capita prekindergarten funding across counties and years for the years 2008{2020 to examine the correlation between prekindergarten and the labor market and child welfare outcomes of interest. Speci cally, we use a xed e ects model that estimates the remaining correlation between county-level prekindergarten per capita funding and the employment and child maltreatment outcomes after accounting for relevant county characteristics as well as county-speci c trends in prekindergarten provision, labor market conditions, and child maltreatment.

We also include a quadratic of per capita prekindergarten funding in our model. The quadratic accounts for the fact the correlation between each of the outcomes and prekindergarten may change depending on the level of prekindergarten per capita funding already in the county. This allows the model to estimate whether there are increasing, decreasing, or constant returns to an additional dollar of prekindergarten funding per capita. Finally, we also control for whether the variables are observed before or after 2015. In 2015 extended-day prekindergarten became availble, which would also entail an increase in the budget required to support the program.

Of course, correlation does not equal causation|i.e., just because we nd that prekindergarten is correlated with the outcomes does not necessarily mean that prekindergarten causesthese outcomes. We, therefore, also do a few checks with our data to provide added suggestive evidence to support the inference that our ndings are due to a relationship between the outcomes and prekindergarten (or at least early childhood programming) and not some other underlying factor.

More details on the statistical methods we use can be found in the Appendix.

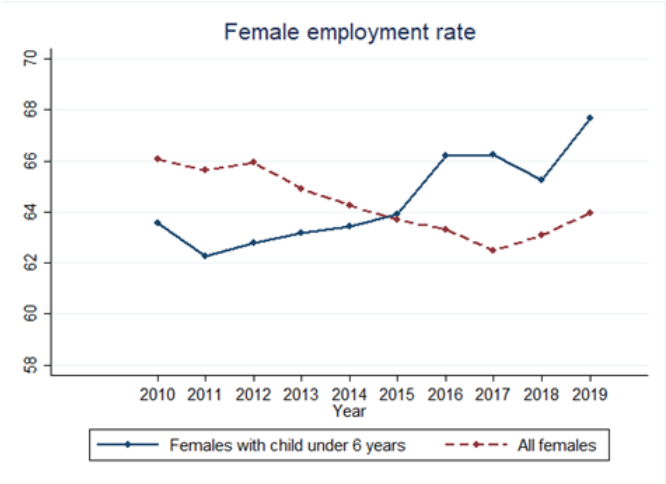
5 Female Labor Force Participation and Prekindergarten in New Mexico

The economic bene ts of more women participating in the labor market are many including GDP growth, higher wages for men and women, reduced inequality, and higher income for households ([Verick, 2018, Weinstein, 2017]). Family friendly policies such as those that enhance access to and reduce the costs of childcare and preschool also reduce the costs and trade-o s women face in their labor supply decisions and can thus encourage their participation in the labor market ([Winkler, 2022]). For families with young children, parental participation in the labor market necessarily imposes the cost of providing care for their children while at work. Consequently, policies that reduce to costs of childcare/preschool further enhance the e ective wages of a household (i.e., earned wages minus the cost of working) by lowering the costs of labor market participation for parents (particularly mothers) with young children.

Prior research indicates that policies that expand eligibility and improve access to preschool can be associated with increased female labor force participation ([Sall, 2014, Carta and Rizzica, 2018, Halim et al., 2019, Li, 2020]). Since these policies also reduce the nancial burden of caring for children while at work, there is also evidence that they can lower the reservation wage (the minimum wage needed to enter the labor market) of mothers ([Carta and Rizzica, 2018]).

However, the extent that preschool expansion policies/programs improve female labor force participation (if at all) depends on a number of factors. First, it depends on current rates of both preschool attendance and female employment; if both are high then additional support allocated to preschool may yield little female employment e ects. Second, prekindergarten will have little in uence on levels of female employment if it crowds out private preschool/childcare or informal childcare (e.g., care by extended family members). Finally, it depends on the elasticity (i.e., responsiveness) of female labor supply. For example, the labor supply of single mothers tends to be relatively unresponsive (i.e., inelastic) to policy reforms as they generally have little exibility in how much they must work in order to support their households. Married mothers' labor supply, on the other hand, is typically much more responsive (i.e., elastic) ([Gelback, 2002, Halim et al., 2019]). Therefore, whether or not New Mexico's prekindergarten program is associated with higher female employment remains an empirical question.

Figure 4: Female labor force participation women with children under age 6 increases over time while overall female employment declines



Because the availability and accessibility of prekindergarten should only matter to the labor supply decisions of mothers with young children, our female labor force participation analysis focuses on the employment of women with children under the age of 6. Figures 3 and 4 provide the rst indication that there is a positive correlation between prekindergarten and female labor force participation. 3 shows a the substantial increase in levels of funding to and participation in New Mexico prekindergarten programs over time. Simultaneously, Figure 4 demonstrates that the female employment rate increased over this same period for women with children under the age of six, while the employment rate for women overall declined.

These trends are supported by model estimates. Figure 5 plots the county-level employment rate of these women predicted at di erent levels of per capita prekindergarten funding based on New Mexico county data. The shaded area in Figure 5 represents the margin of error in these predictions.

Figure 5: Additional per capita PreK funding is associated with increased female labor market participation for women with children under age 6

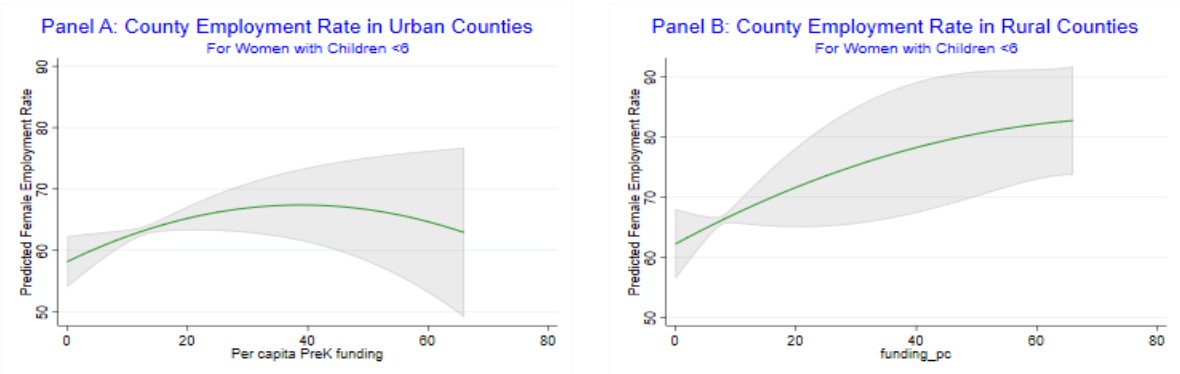
Notes: This gure plots the county-level employment rate for women with children under age 6 predicted by levels of per capita Pre-K funding. The shaded area represents the margin of error in the model's predictions. Our model, using New Mexico data, predicts higher levels of state-funded Pre-K is correlated with higher employment of women with young children. It also nds a stronger correlation for counties with lower levels of prekindergarten.

We nd that an additional dollar per capita allocated to prekindergarten is correlated with an

increases of the employment rate of women with young children by approximately 0.34%, on average across counties. However, we also nd that this relationship exhibits diminishing returns with higher levels of funding. In other words, an additional dollar per capita to PreK will exert a much larger improvement in the employment rate of of mothers with young children in counties where state Pre-K funding is low than in counties that already have of a high level of these resources. This makes sense as it is plausible that as prekindergarten availability rises in a county, there will be fewer and fewer mothers whose labor supply decisions are in uenced by state-provided prekindergarten.

We also split the sample between rural and urban/suburban counties. These results are reported in Figure 6. For both urban and rural counties, there is a positive correlation between New Mexico's state prekindergarten and the employment rate of women with young children. However, this relationship is particularly strong for rural areas, pointing to the added employment bene ts of investing in these areas. While this correlation in urban areas is positive, it is only statistically di erent from zero (i.e., zero is not within the margin of error) for funding levels below$25 per capita.

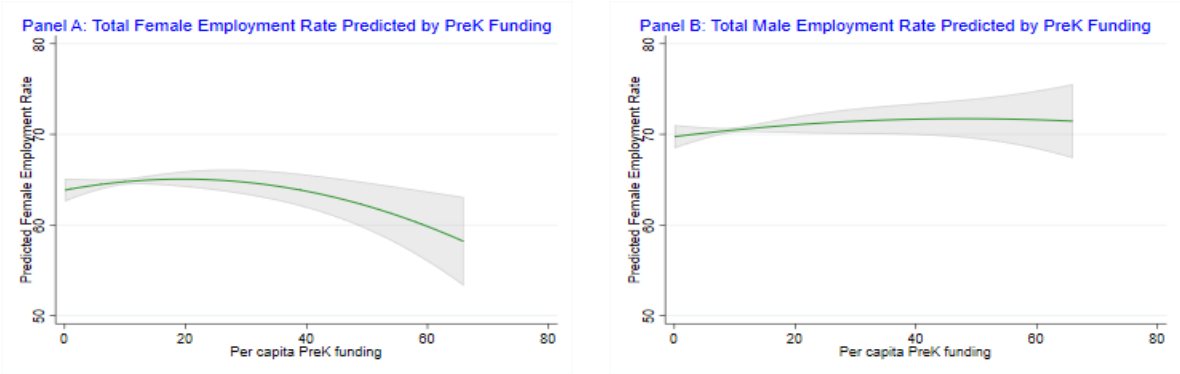
Figure 6: Additional per capita PreK funding is associated with increased female labor market participation for women with children under age 6 at a faster rate in rural areas than in urban.



Notes: Separately for rural and urban/suburban counties, this gure plots the county-level employment rate for women with children under age 6 predicted by levels of per capita Pre-K funding. Panel A plots predicted employment in urban/suburban counties and panel B plots that for rural counties. The shaded area represents the margin of error in the model's predictions. The positive correlation between Pre-K and the employment rate for women with young children is much stronger in rural counties than in urban/suburban.

Although our model accounts for county-speci c trends in both maternal employment and prekindergarten funding, it is plausible that the correlations we estimate are due to unobserved factors driving both perkindergarten funding and general labor market conditions and/or female labor force participation in New Mexico counties. While we cannot perfectly test for this problem, we do estimate our model with total female employment and total male employment in each county as the outcome rather than just the employment of women with children under age 6. Predicted total female employment in county as a function of prekindergarten funding is plotted in Panel A of Figure 7 and that for total male employment is found in Panel B.

Figure 7: Additional per capita PreK funding is not signi cantly associated with the total county employment rate of women and men



Notes: This gure plots the county-level total employment rate for all women and men by levels of per capita Pre-K funding. Panel A plots predicted county employment rate for women and Panel B reports that for men. The shaded area represents the margin of error in the model's predictions. The correlation between Pre-K funding and total female and male employment rate is not statistically di erent from zero.

Prekindergarten provision should only be relevant to the employment of women with young children and thus should not exert a large in uence on the overall employment of women and men. Therefore, if early childhood state programming, and not other correlates, is what is driving the positive correlation we nd, then we would not expect to nd a similar relationship between PreK programming levels and overall female or male employment as that observed in Figure 5. The results plotted in Figure 7 indicate that the correlation between PreK funding and total female and male county-level employment rates is e ectively zero. The lines in Figure 7 are essentially at. This means that unlike the clear positive correlation with the employment rate of women with young children, changes in per capita prekindergarten funding is not associated with any changes in the total employment rate of women and men.

6 Child Maltreatment and Prekindergarten in New Mexico

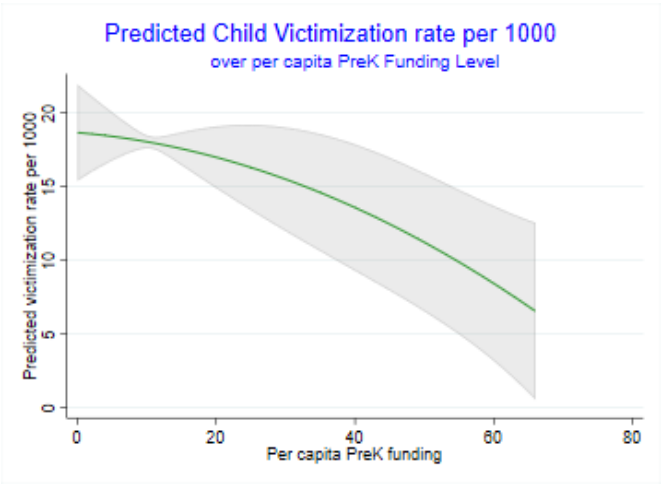
New Mexico consistently ranks as among the worst states in the nation in measures of child welfare and maltreatment. According to the Administration for Children and Families (ACF), New Mexico's child victimization rate during the years 2016-2020 was 14.9 per 1000 children. This was nearly double the national rate of 8.4 per 1000. Consequently, addressing child maltreatment in the state is a policy priority.

Early childhood education programs, such as prekindergarten, can be one way to address child maltreatment. Exposure to early childhood education programs can a ect parental behaviors relating to discipline and correct potentially unrealistic expectations for child behavior on the part of parents ([Zhai et al., 2013, Green et al., 2020]). It is also associated with increased parental/household income and more stable employment ([Pac, 2021]), which is in turn associated with reduced parental stress and improved mental health ([Zhai et al., 2013, Ellenbogen et al., 2014, Green et al., 2020, Pac, 2021]). Issues surrounding parental stress and income are often cited as primary determinants for child maltreatment ([Pac, 2021]). Early childhood education programs can also a ect child behaviors and other child characteristics that are sometimes associated with maltreatment ([Green et al., 2020]). Finally, greater access to early childhood education programs also allows for better monitoring of at risk children during the pre-school-age period when they typically spend less time with mandatory reporters ([Ellenbogen et al., 2014, Zhai et al., 2013, Pac, 2021]).

If prekindergarten increases time with potential reporters of maltreatment, then one can imagine a scenario in which reported levels of child maltreatment rises with prekindergarten programming, simply due to greater opportunity to observe maltreatment cases. Ideally, as visibility through early childhood programming rises, levels of con rmed child maltreatment would decline.

Figure 8 plots the average county-level child victimization rates (measured as number of child victims per 1000) predicted by level of per capita prekindergarten funding in a county. Unlike predicted female employment (Figure 4), which increases at a diminishing rate, we nd that child victimization decreases at anincreasing rate as per capita prekindergarten funding rises. This suggests that each additional per capita county dollar allocated to prekindergarten is correlated with a larger reduction in child victimization rates as levels of prekindergarten rise in a county. As prekindergarten programming grows, it is likely that these programs get better at recognizing and addressing maltreatment issues as they arise and also improve in their ability to work with potentially at-risk parents and children.

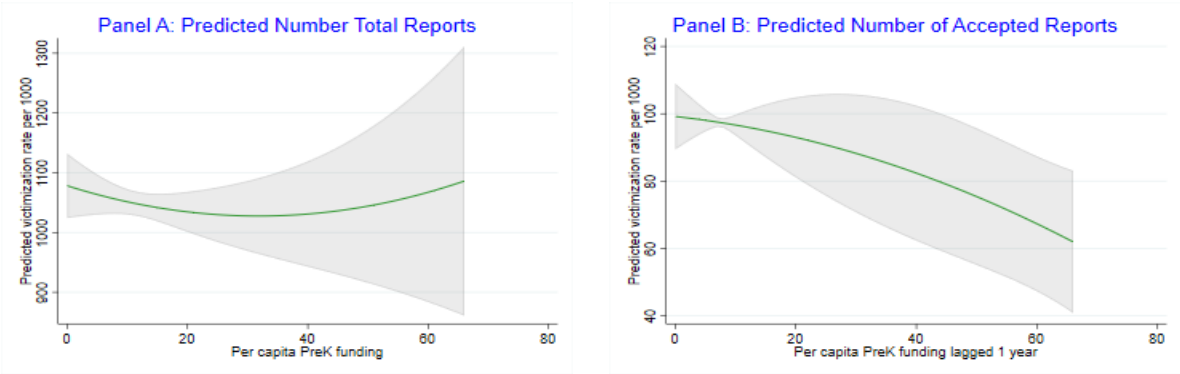
Figure 8: Additional per capita PreK funding in a county is associated with a decline in rates of child maltreatment (victim rate per 1000).



Notes: This gure plots the county-level child victim rate per 1000 predicted by levels of per capita Pre-K funding. The shaded area represents the margin of error in the model's predictions. Our model predicts lower levels of child victimization is associated with higher levels of Pre-K.

We do not know which, if any, of the above potential mechanisms underlie the negative correlation we nd between prekindergarten and child victimization rates. We look for a monitoring e ect in Fgure 9, which plots the predictd average number of total reports of abuse and neglect across counties in Panel A. Panel B of Fgure 9 plots the average number of accepted reports. The number of accepted reports is the amount of reports out of the total reports made with su cient evidence to support further investigation of the claim by the CYFD. Due to the time lapse between when reports are made and when they are accepted for further investigation, we predict the number of accepted reports with the prior year's county-level per capita prekindergarten funding.

Figure 9: Additional per capita PreK funding in a county is associated with a higher number of total reports of child abuse/neglect but a decline in the percent of those reports accepted to warrant investigation



Notes: This gure plots the county-level number of total reports of child abuse and neglect and the percent of reports accepted for further investigation predicted by Pre-K per capita funding. Panel A reports predicted total reports and Panel B reports predicted accepted reports. The shaded area represents the margin of error in the model's predictions. Our model predicts that while total reports is positively correlated with Pre-K levels, the percent of accepted reports is predicted to decline with higher Pre-K levels.

Looking at Figure 9, we do not see much evidence of a monitoring e ect. The predicted number of total reports of child victimization (Fgure 9, Panel A) appears largely unresponsive to levels of prekindergarten funding. The line is largely at, with a wide margin of error at high levels of prekindergarten funding, meaning that the number of total reports does not change, on average, with prekindergarten support. On the other hand, the number of reports accepted for futher investigation clearly declines with prekindergarten supprot (Figure 9, Panel B). Therefore, it is possible that some of the other mechanisms discussed (e.g., aspects of parent and child behaviors and parental well-being) are in uencing the decline in child victimization rates.

7 Conclusion

New Mexico consistently ranks among the worst in the nation in numerous measures of child well-being. However, in the last decade it greatly expanded its early childhood programming portfolio and it is currently is a national leader in state-supported early childhood interventions|particularly in the area of preschool. For example, in 2012 New Mexico ranked 31st in the county in state resources devoted to preschool compared to 10th in the nation by 2021. Evidence on the educational bene ts of the New Mexico's program speci cally and on the wider bene ts of preschool generally are encouraging and hold promise that they state will improve in areas it has struggled.

We nd a clear association between prekindergarten support and improved female labor force participation and lower rates of child maltreatment. These outcomes are not targeted objectives of state prekindergarten and thus suggest the potential existence of positive spillover e ects related to early childhood programming.

Again, it is important to note that we cannot claim causality. There may be other correlates that our model is not accounting for. Speci cally, we are currently unable to disentangle the e ects of prekindergarten support on our outcomes of interest from the e ects of the state's other early childhood interventions. However, our results present strong suggestive evidence that these programs are bene ting female employment and child maltreatment.

References

W. Barnett and L. Masse. Comparative bene t-cost analysis of the abecedarian program and its policy implications. Economics of Educaiton Review, 26:113{125, 2007.

F. Carta and L. Rizzica. Early kindergarten, maternal labor supply and children's outcomes: Evidence from italy. Journal of Public Economics, 158:79{102, 2018.

J. Currie and D. Thomas. School quality and the longer-term e ects of head start. Journal of Human Resources, 35(4):755{774, 2000.

Early Childhood Education & Care Department. New mexico early childhood education and care department annual outcomes report for scal year 2021. Technical report, 2022.

S. Ellenbogen, B. Klein, and C. Wekerle. Early childhood education as a resilience intervention for maltreated children. Early Child Development and Care, 184(9-10):1364{1377, 2014.

A. Freidman-Krauss, W. Barnett, K. Garver, G. Hodges, K.S. Weisenfeld, B. Gardiner, and T. Jost. The state of preschool 2021: State preschool yearbook. Technical report, National Institute for Early Education Research (NIEER), New Brunswick, NJ, 2022.

J. Garcia, J. Heckman, D. Leaf, and M. Prados. Quantifying the life-cycle bene ts of an in uencial early-childhood program. Journal of Political Economy, 128(7):2502{2541, 2020.

J. Gelback. Public schooling for young children and maternal labor supply. The American Economic Review, 92(1), 2002.

B. Green, C. Ayoub, J. Bartlett, C. Furrer, R. Chazan-Cohen, K. Buttitta, A. Von Ende, A. Koepp, and E. Regalbuto. Pathways to prevention: Early head start outcome in the rst three years lead to long-term reductions in child maltreatment. Children and Youth Services Review, 118(105403), 2020.

D. Halim, H. Johnson, and E. Perova. Preschool availability and female labor force participation: Evidence from indonesia. World Bank Policy Research Working Paper, 8915, 2019.

J. Heckman and D. Masterov. The productivity argument for investing in young children. Review of Agricultural Economics, 29(3):446{493, 2007.

J. Heckman, R. Grunewald, and A. Reynolds. The dollars and cents of investing early: Cost-bene t analysis in early care and education. Zero to Three, 36(6):10{17, 2006.

J. Heckman, S. Moon, R. Pinto, P. Savelyez, and A. Yavitz. The rate of return to the high scope preschool program. Journal of Public Economics, 94(1-2):114{128, 2010.

J. Hustedt, S. Barnett, and K. Jung. The e ects of new mexico prek initiatve on young children's school readiness. Technical report, National Institute for Early Education Research (NIEER), 2007. URL https://nieer.org/wp-content/uploads/2017/10/NM-RDD-report-2007.pdf .

J. Hustedt, K. Jung, A. Freidman-Krauss, S. Barnett, and G. Slicker. Impacts of the new mexico prek initiative by children's race/ethnicity. Early Childhood Research Quarterly, 54: 194{203, 2021.

Legislative Finance Committee (LFC). 2018 accountability report: Childcare assistance outcomes. Technical report, 2018. URL https://www.nmlegis.gov/Entity/LFC/Documents/Early_Childhood_And_Education/2018%20Accountability%20Report%20Childcare%20Assistance%20Outcomes.pdf.

H. Li. The e ect of universal prekindergarten policy on female labor force participation{a synthetic control approach. Southern Economic Journal, 87(2):440{482, 2020.

J. Pac. Early childhood education and care programs in the united states: Does access improve child safey? Social Science Review, 95(1):66{109, 2021.

A. Rolnick and R. Grunewald. Early education's big dividends: The better public investment. Technical report, 2008.

S. Sall. Maternal labor supply and the availability of public pre-k: Evidence from the introduction of prekindergarten into american public schools. Economic Inquiry, 52(1): 17{34, 2014.

S. Verick. Female labor force participation and development. IZA World of Labor , 87, 2018.

A. Weinstein. Working women in the city and ugran wage growth in the united states. Journal of Regional Science, 57(4), 2017.

A. Winkler. Women's labor force participation. IZA World of Labor , 289, 2022.

F. Zhai, J. Waldfogel, and J. Brooks-Gunn. Estimating the e ects of head start on parenting and child maltreatment. Children and Youth Services, 35(7):1119{1129, 2013.

APPENDIX

A.1 Data and Methods

To perform the analysis in this paper, we compiled data from multiple sources. The New Mexico Legislative Finance Committee (LFC) provided us with annual data on county-speci c prekindergarten funding and child participant numbers for the years 2008-2020. We obtain data on county-level female and male employment from the American Community Survey (ACS). We also obtain information on all of our control variables from the ACS, which in this paper includes for each New Mexico county, the percent of women married, widowed, or never married; the proportion of the county's population who's highest school attainment is below high school, a high school diploma, or a college degree. All variables extracted from the ACS are based on ve-year moving averages. We manually extracted data on child maltreatment from the \360 Annual Reports" put out by the Child Youth and Family Department Protective Services.

Our empirical method exploits the longitudinal nature of county-level outcome and prekindergarten programming data. To obtain our estimates of the association between the level of prekindergarten support and female employment and child welfare, we use a county- xed effects model that also controls for county-speci c time trends. Speci cally, we estimate the following model:

$$Y_{ct} = {}_0 + {}_1 PreK_{ct} + {}_2 PreK_{ct}^2 + {}_3 X_{ct} + {}_4 Post2015 + u_c + u_{ct} + "_{ct} \qquad (1)$$

where Y_{ct} represent one of our outcomes of interest in county c and year t; these outcomes include female employment among women with children under 6, child victimization rates per 1000, total reports of child neglect or abuse, and number of accepted reports of child abuse or neglect. $PreK_{ct}$ is the level of per capita funding allocated to prekindergarten in county c and year t. X_{ct} is a matrix of our control variables, which are listed above. $Post2015$ is an indicator for if an observation occurs in the year 2015 or after, when extended-day prekindergarten became available, which necessitated large increases in prekindergarten funding across all New Mexico counties. u_c is a vector of county xed e ects and u_{ct} is county-speci c time trends. u_c and u_{ct} account for average conditions and trends in the variables within each county.

To better understand what we are capturing in equation 1, we will break it down into parts. Equation 2, below, is the simplest model we can estimate and provides us with the \correlation coe cient" between prekindergarten funding and the child welfare and female employment outcomes variables:

$$Y_{ct} = {}_0 + {}_1 PreK_{ct} + "_{ct}: \qquad (2)$$

For simplicity, we will focus on child victimization as our outcome. The intercept, ${}_0$, captures the conditional average level of of child victimization (Y_{ct}) over time and across counties within the state once prekindergarten funding is accounted for (i.e., it's the predicted average when state prekindergarten funding per capita is at zero). Then, since we condition out that average, the slope, ${}_1$, represents the average correlation between deviations in per capita prekindergarten funding from the state's overall average level of funding (over time and across counties) and deviations in the child victimization rate from its average (over time and across counties). Of course, correlation does not equal causation. So, just because our outcomes are correlated with prekindergarten support does not necessarily mean that prekindergarten support causeschild victimization rates.

Since we perform county-level analysis, it is logical to think that we may be simply picking up average di erences across counties. It may be that counties with low levels of prekindergarten may also have low rates of child victimization, for completely unrelated reasons. For example, there may be other county characteristics that are a ecting both, which is what could underly any correlation estimated by equation 2. Therefore we can add \county xed e ects" to our model, denoted as u_c as follows:

$$Y_{ct} = \ _0 + \ _1 PreK_{ct} + u_c + "_{ct} \tag{3}$$

Now $_1$ in equation 3 represents the conditional correlation, averaged over counties, between per capita prekindergarten funding and our outcomes after conditioning out the part of the correlation in equation 2 that is due to county-speci c averages in both variables.[8] However, we may still be concerned that we are simply be picking up trends in both variables. For example it could be that counties in which prekindergarten support is increasing at faster rates are also ones in which child victimization rates are at declining faster rates. For example, at the same time prekindergarten support is increasing, a county may also be ramping up child protective services. To account for this scenario, we can add county-speci c trends $u_{ct} = u_c \quad$ year, as follows:

$$Y_{ct} = \ _0 + \ _1 PreK_{ct} + u_c + u_{ct} + "_{ct} \tag{4}$$

Now $_1$ in equation 4 represents the conditional correlation, averaged over counties, between per capital prekindergarten funding and our outcomes after conditioning out the part of the correlation in equation 2 that is due to county-speci c averages and county-speci c trends in both variables. Finally we add county characteristics and the 2015 indicator variable as controls, X_{ct} and $Post2015$, that may be correlated with both the outcome variables and levels of prekindergarten. We also add a quadratic term of county per capita prekindergarten funding to allow for the fact that the marginal impact of a dollar per capita prekindergarten funding may be di erent at low versus high levels of support. This leaves us with our main model depicted in equation 1.

Based on equation 1, the correlation between one additional per capita dollar spent on prekindergarten in a county is calculated as:

$$_1 + (2 \quad _2 PreK_{ct}) \tag{5}$$

In the absence of randomized prekindergarten provision across counties or a natural experiment, we still can not interpret the estimated correlation as purely causal. However, given that we account for county-speci c characteristics, xed e ects, and trends, we believe that it provides strong suggestive evidence for a genuine relationship between state-provided prekindergarten and female employment and child welfare in New Mexico. We also perform a few checks where possible to provided added support for this evidence.

[8] A good example of this scenario is that we might nd that both crime and ice cream consumption increases in the summer|making them positively correlated. Of course, ice cream does not \cause" crime. If we then include seasonal xed e ects, the estimated correlation between these to variables is driven to zero. This is because the seasonal xed e ects account for the fact that these two behaviors are both driven by season.

A.2 Results

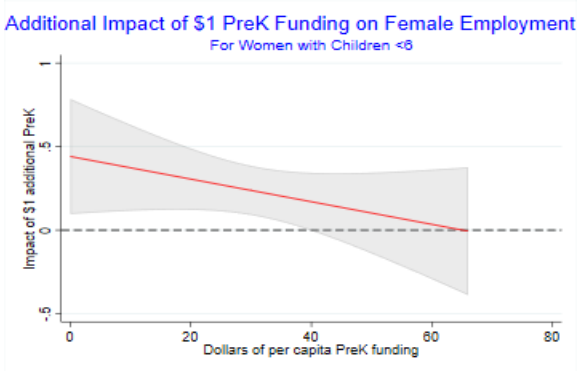
Estimates from equation 1 for female employment for women with children under age 6 can be found in Table A.1. The coe cients reported in Table A.1 are those used to compute the predicted employment levels depicted in Figures 4 and 6. Because $_1$ is positive but $_2$ is negative the model nds that employment for these women is positive but declines (i.e., is positive but smaller) at higher levels of prekindergarten funding. This declining marginal association can be seen in the left panel of Figure A.1. This is why we see employment initially rise but then taper o in Figure 4, which is also provided in the right panel of Figure A.1

Table A.1: Association between current PreK funding/participation and Female Employment for Women with Children under age 6 Years

	Women with Children under 6 Years		
	(1) Pooled	(2) Urban/Suburban	(3) Rural
Per capita PreK funding	0.441	0.475	0.504
	(0.176)	(0.183)	(0.309)
Per capita PreK funding squared	-0.00339	-0.00611	-0.00304
	(0.00257)	(0.00263)	(0.00407)
Constant	562.2	1219.6	-271.0
	(1394.2)	(788.1)	(3662.8)
Observations	324	209	115

p< 0.01, p< 0.05, p< 0.1, + p< 0.15

Figure A.1: The marginal impact of one additional per capital dollar of PreK funding in a county declines as total funding levels rise (right panel). Employment of women with children under 6 increases with higher levels of per capita PreK funding at a diminishing rate (left panel).



Notes: County-level data and outcomes

Again, correlation does not equal causation. For example, counties with rising trends in prekindergarten funding may also be counties with improving labor market conditions. If this is the case, then we would expect to see a similar relationship between prekindergarten support and total male and female employment as we do for women with young children. To check this, we estimate equation 1 with the county-level employment rate for all men and women instead of for only women with children under age 6. The estimated coe cients from this exercise are reported in Table A.2. According to Figure 7, employment levels of all men and women in a county do not change much, if at all, with levels of per capita prekindergarten funding. This is suggestive that the positive correlation estimated in our main ndings is unlikely to be due to other factors driving county-level labor market conditions that are also correlated with trends in prekindergarten support.

Table A.2: The Association between County per capital PreK funding and Employment for Women with Children under 6 is Postitive but that for All Women or All Men is not Statistically Di erent from Zero

	Quadratic Model		
	(1) Women with Young Children	(2) All Women	(3) All Men
Per capita PreK funding	0.441	0.125	0.0824
	(0.176)	(0.0730)	(0.0753)
Per capita PreK funding squared	-0.00339	-0.00319	-0.000856
	(0.00257)	(0.00126)	(0.00122)
Constant	562.2	688.9	636.9
	(1394.2)	(429.7)	(373.7)
Observations	324	329	329

	Linear Model		
	(1) Women with Young Children	(2) All Women	(3) All Men
Per capita PreK funding	0.260	-0.0483	0.0360
	(0.0738)	(0.0366)	(0.0314)
Constant	476.2	613.8	616.8
	(1399.4)	(440.9)	(370.5)
Observations	324	329	329

p< 0.01, p< 0.05, p< 0.1, + p< 0.15

Finally, it is also plausible that counties with increasing levels of prekindergarten support are also counties where maternal employment is improving for unrelated reasons. Although it is di cult to envision reasons unrelated to early childcare infrastructure that would solely a ect the employment rate of women of young children and not other women or men. This concern is also somewhat mitigated by the inclusion of county-speci c time trends, however, it is not