See Your Therapists: Mental Health Insurance Parity and Healthcare Supply

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Abstract

For decades, substantial efforts have been made to improve access to mental healthcare by mandating coverage expansions in U.S. health insurance plans. However, there is little evidence that such expansions have successfully induced increases in the supply quantities for mental health services in response to potential shifts in demand. This paper examines the impacts of Mental Health Insurance Parity (MHIP) laws on the supply of mental healthcare professionals in local markets at the extensive and intensive margins, leveraging variation in their implementation across states over time. The empirical results demonstrate that MHIP laws have increased the provision of mental healthcare at the extensive margin, particularly through an increased entry of self-employed mental health therapists. Additionally, at the intensive margin, mental health therapists are found to increase their weekly work hours following the implementation of MHIP laws. These findings suggest that policy interventions can be effective in establishing a more accessible environment for mental healthcare, which bridges the existing gap in the literature.

JEL Codes: I13, I18, J22, J24, J61.
Keywords: Mental health, Parity laws, Insurance mandates, Local healthcare supply, Mental therapists.

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1 Introduction

Mental illness . . . is a medical problem, just like heart disease or diabetes.

— American Psychiatric Association.[1]

While mental illness is a prevalent phenomenon, the utilization of mental healthcare services remains relatively low in the United States. According to the Substance Abuse and Mental Health Services Administration of the U.S. Department of Health and Human Services, one in five adults currently experiences a mental health issue, and one in two adults will experience one during their lifetime.[2] Additionally, one in twenty adults suffers from serious mental illnesses such as major depressive disorder, which is a major risk factor for suicide—a leading cause of death. However, the National Alliance on Mental Illness reports that only 47.2% of individuals with mental illness and 65.4% of those with serious mental illness received treatment in 2021.[3] Furthermore, there is a notable delay in treatment of approximately 11 years on average from the onset of mental illness symptoms.

As insufficient insurance coverage for mental healthcare impedes access to adequate treatment, policy interventions have been introduced to expand the coverage. Despite the economic importance of mental health as human capital (Bartel and Taubman, 1979, 1986; Berndt et al., 1998; Currie and Stabile, 2006) and its strong association with physical health (Chapman et al., 2004; Evans et al., 2005; El-Gabalawy et al., 2010), insurance coverage has historically been limited for mental healthcare compared to physical healthcare. For example, insurance plans often impose higher coinsurance rates and stricter limits on the number of covered visits. Several factors contribute to this imbalance, including stigma surrounding individuals with mental distress, misconceptions about mental illness, concerns regarding adverse selection (McGuire and Montgomery, 1982), and the high demand elasticity of mental health services (Manning et al., 1986). To improve access to mental healthcare, many states implemented Mental Health Insurance Parity (MHIP) laws during the 1990s and 2000s. These laws mandate "parity" in employer-sponsored insurance plans, meaning mental health benefits must be provided at the same level as physical health benefits. Given the ongoing shortage of mental health therapists within health insurance networks (Honberg et al., 2015), the need to evaluate the effectiveness of MHIP laws persists, even decades after their initial implementation.

This paper quantifies how MHIP laws impact the supply of mental healthcare services.

[1] American Psychiatric Association, "What is Mental Illness?", Accessed April 2025, `https://www.psychiatry.org/patients-families/what-is-mental-illness`.

[2] Substance Abuse and Mental Health Services Administration, "Mental Health: Get the Facts," U.S. Department of Health and Human Services, Accessed April 2025, `https://www.samhsa.gov/mental-health/what-is-mental-health/facts`.

[3] National Alliance on Mental Health, "Mental Health by the Numbers," Accessed April 2025, `https://www.nami.org/about-mental-illness/mental-health-by-the-numbers/`.

Specifically, I examine the effects of MHIP laws on labor market attachment among mental healthcare providers at both the extensive and intensive margins. I also characterize which types of mental health therapists are more likely to respond to MHIP laws. The econometric strategy exploits a natural experiment, where the timing of MHIP law implementation varies across states. This approach allows for comparison between otherwise plausibly comparable health practitioners who are affected (treatment group) and not affected (control group) by MHIP laws, using a staggered difference-in-differences design. Additionally, I check the robustness of the results using heterogeneity-robust estimators proposed by Callaway and Sant'Anna (2021) and Cengiz et al. (2019), which address potential biases associated with heterogenous treatment effects over time.

My findings show that MHIP laws lead to a minimal increase in the overall employment of mental health therapists at the extensive margin. More substantial effects are observed in self-employment, where the number of private mental health clinics significantly increases following the implementation of the laws. This growth in self-employment remains persistent and intensifies over time for mental health therapists. These differential estimates between employment and self-employment suggest that MHIP laws encourage the entry of therapists into private practices, likely in response to rising demand for outpatient rather than inpatient services. The self-employment effect is more pronounced among non-physician providers, such as psychologists and counselors, than among physician providers, such as psychiatrists. This difference indicates that the increase in the supply of mental healthcare is more concentrated in providers of psychotherapy services rather than medication-based treatment. Additionally, the increase appears to be driven by individuals with older children, while no systematic changes are detected in the age or gender composition of the workforce.

At the intensive margin, furthermore, I find that MHIP laws lead to a statistically significant increase in the number of weekly hours worked by mental health therapists. Event-study estimates show that work hours rise steadily after the laws take effect. These findings suggest that mental health therapists respond to heightened service demand not only by entering the workforce but also by intensifying their labor supply—working longer hours to meet patient needs under expanded insurance coverage.

This paper is the first to shed light on the supply side of the mental healthcare market under MHIP laws by highlighting changes in the availability of mental health therapists. Recent studies have found that individuals with mental distress can benefit from these mandates, despite the potential incidence of the insurance costs (Summers, 1989). Specifically, the expansion of health insurance coverage for mental illnesses prevents suicide (Klick and Markowitz, 2006; Lang, 2013), improves academic performance among college students (Solomon and Dasgupta, 2022), increases wages and work hours (Andersen, 2015), and promotes healthier births (Carney, 2021). However, there remains limited evidence that such expansions lead to improved access to mental healthcare. The

literature has yet to document statistically significant and consistent increases in the use of mental healthcare services (Bao and Sturm, 2004; Harris et al., 2006; Busch and Barry, 2008), leaving a missing link from the recent findings. Consequently, this paper bridges the gap in the literature by empirically testing whether MHIP laws successfully increase the supply of mental healthcare services.

Section 2 presents the institutional and conceptual backgrounds on MHIP laws and mental healthcare services. Section 3 describes the data on mental healthcare providers. Section 4 outlines the empirical strategy, and Section 5 reports the estimated effects of MHIP laws on the supply of mental healthcare at the extensive and intensive margins. Future directions for this research are discussed in Section 6. Finally, Section 7 concludes by addressing policy implications aimed at improving access to mental healthcare.

2 Backgrounds

2.1 Institutional Background

As defined by psychiatric guidelines from the World Health Organization (WHO) and the American Psychiatric Association (APA), a mental disorder involves clinically significant disruptions in cognitive, emotional, and behavioral functioning. Today, mental disorders are commonly recognized as being closely linked to biological, psychological, and developmental factors throughout an individual's life. Symptoms vary widely in both presentation and severity, ranging from mild to moderate to severe. Mild conditions, such as depressive feelings, may cause distress but typically have a limited impact on daily life. In contrast, moderate conditions, including eating disorders, anxiety disorders, and obsessive-compulsive disorder, can interfere with daily functioning and negatively affect work or social interactions (see Howard et al., 2014). Meanwhile, schizophrenia, major depressive disorder, and bipolar disorder—conditions that substantially impair major life activities and may cause even long-term neurological damage—are often classified as severe (see Jones et al., 2014). Many mental illnesses can be clinically diagnosed based on detailed criteria and effectively managed with appropriate treatment by mental health professionals (American Psychiatric Association, 2013). In particular, the efficacy of both psychotherapy and medication is well established in alleviating symptoms of depression and anxiety (e.g., Mynors-Wallis et al., 2000; Blanco et al., 2010), which are among the most prevalent conditions in the U.S.

Nevertheless, historically, mental health benefits have been covered more restrictively than physical health benefits under both private and public insurance plans in the U.S. Examples include cases where patients face coinsurance rates of 50% for mental health services, compared to just 20% for outpatient primary care, and where plans impose special annual limits such as 20 outpatient visits or 30 days of hospitalization for mental health

treatment. The findings of Barry and Ridgely (2008) indicate that a substantial share of privately insured employees with mental health coverage faced specific limitations: 74% had caps on the number of outpatient visits, 64% were subject to limits on inpatient care days, and 22% incurred greater out-of-pocket expenses for mental health services compared to other types of healthcare. This discrepancy has long been regarded as a major barrier to accessing adequate mental healthcare. As advances in psychiatry and neuroscience have deepened understanding of mental illness and gradually reduced stigma throughout the late 20th century, advocacy organizations such as the National Alliance on Mental Illness have increasingly called for policy reforms to address the inequality in insurance coverage.

Accordingly, to ensure "parity" between mental and physical healthcare, a new wave of federal and state legislation aimed at expanding insurance coverage emerged in the 1990s. A pivotal moment came in 1996, when the U.S. Congress passed the Mental Health Parity Act, marking a historic step toward achieving parity. In 1998, the federal government began enforcing requirements for mental health coverage under employer-sponsored insurance plans. The federal act stipulated that, if mental health benefits were offered, the associated financial requirements and treatment limitations—such as outpatient visit limits, inpatient day limits, deductibles, copayments, and coinsurance rates—could not be more restrictive than those for physical health care. However, the legislation has often been criticized for establishing only *partial* parity (Gitterman et al., 2001). For example, employers already offering mental health benefits in insurance packages could simply drop them altogether to avoid additional costs for equal coverage, thereby undermining the law's intended impact on affordability and potentially exacerbating the imbalance between mental and physical health coverage.

Aligning with the nationwide movement, many states enacted stronger laws requiring employer-sponsored health insurance plans to provide equal benefits for mental and physical health, known as Mental Health Insurance Parity (MHIP) laws. Although nearly all states sought to reduce the disparity in access between mental and physical healthcare, the strength of these legislative attempts varied considerably. Following Lang (2013)'s classification, this paper defines state-level regulations as MHIP laws if they aim to achieve *full* parity in either of the following forms: (i) requiring insurance plans to include equal mental and physical health benefits, or (ii) requiring insurance plans to offer enrollees the option to purchase mental health coverage at parity with physical health coverage.[4] By this definition, six states implemented MHIP laws in the mid-1990s, ten in the late 1990s, fourteen in the early 2000s, and four in the late 2000s. Figure 1 geographically

[4]Lang (2013) explains that there are also two other forms: Minimum Mandated Benefit (MMB) and Mandated If Offered (MIO) laws. MMB laws require a minimum level of mental health coverage but allow for different terms and conditions compared to physical health benefits. MIO laws largely mirror the federal act, permitting employers to opt out of offering mental health coverage altogether. Therefore, both MMB and MIO laws do not mandate full parity between mental and physical healthcare.

illustrates the timeline of MHIP law implementation across states from 1995 to 2007.

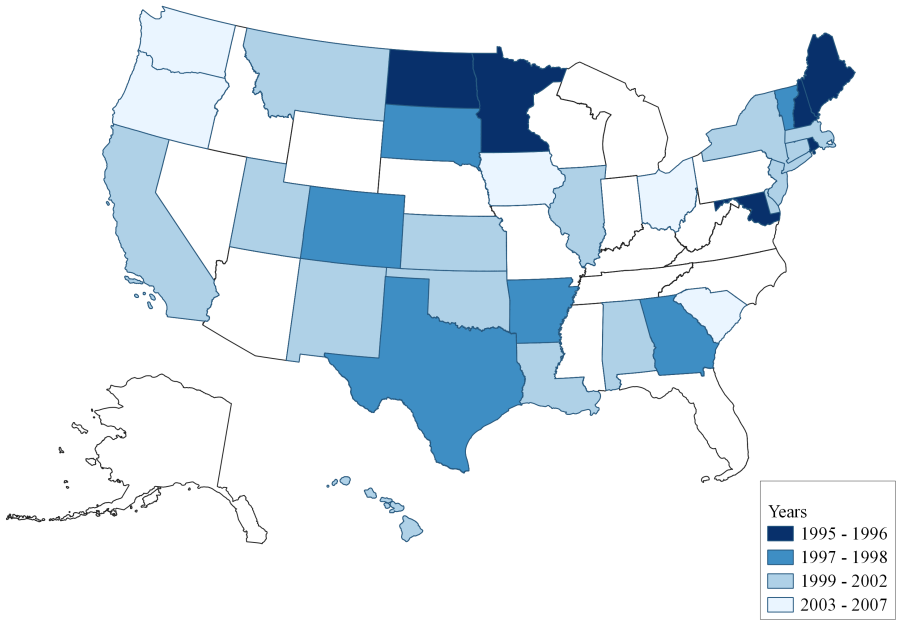


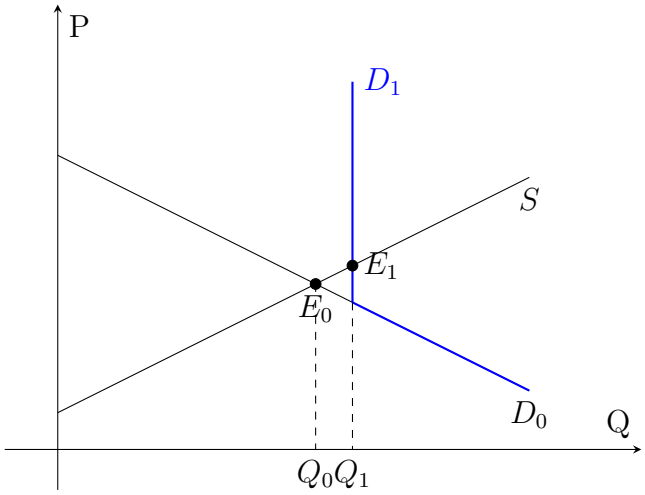
Figure 1: Implementation of MHIP Laws across States
Source: Lang (2013). I am grateful to Matthew Lang for providing updated information regarding the state MHIP laws as of 2008.

The binding scope of MHIP laws in the private health insurance market, however, was limited due to notable exemptions. Specifically, firms with a small number of employees—typically below thresholds ranging from 10 to 50—were often exempt from these mandates in many states. Additionally, the Employee Retirement Income Security Act of 1974 preemptively permitted self-insured firms, which tend to employ more workers, to operate outside the purview of these state-level laws. Despite these limitations, MHIP laws still had the potential to directly affect up to half of all workers covered by private insurance plans (Buchmueller et al., 2007).

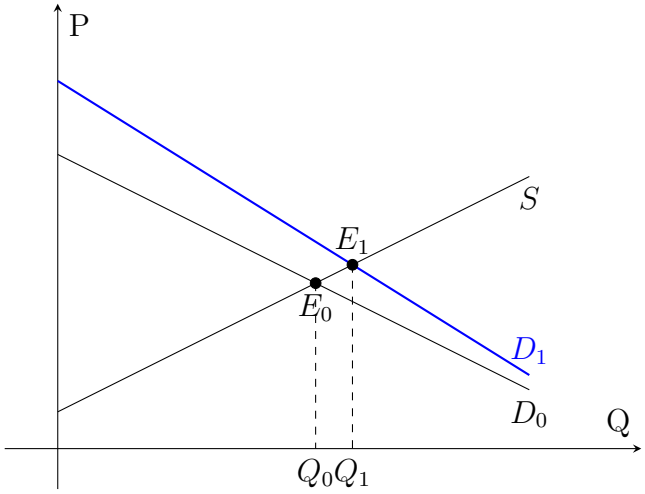
2.2 Conceptual Background

To establish empirically testable hypotheses regarding the effects of MHIP laws on the supply of mental healthcare services, this paper introduces a conceptual framework. Drawing on the classical theory of demand and supply, MHIP laws are expected to increase the utilization of mental health services by reducing the out-of-pocket costs faced by consumers, thereby encouraging more frequent visits to mental health therapists. This prediction is grounded in the seminal model developed by Grossman (1972), which posits that consumers choose an optimal level of health status to maximize their utility under

constraints such as budgets and initial health endowments. In this model, health is conceptualized as a capital stock that depreciates over time and can be augmented through investment, including the consumption of healthcare services. Accordingly, the derived demand for healthcare is strictly decreasing in its price. On the supply side, assuming producers operate competitively to maximize their profits, the supply function is upward sloping. Within this framework, the reduction in the effective price of mental healthcare caused by insurance coverage mandates under MHIP laws would shift the demand curve outward, resulting in a higher equilibrium quantity of mental health services. Figure 2 depicts examples of how the introduction of copayments and coinsurance rates would impact the mental healthcare market, in Panels (a) and (b) respectively.



(a) Copayments



(b) Coinsurance Rates

Figure 2: Illustrations of the Mental Healthcare Market under MHIP Laws

This conceptual framework predicts that producers should respond to the increased demand by supplying a greater quantity of mental healthcare services along their upward-sloping supply curve. In both Panels (a) and (b) of Figure 2, as the market equilibrium

shifts from E_0 to E_1 due to insurance coverage expansions, the supplied quantity increases from Q_0 to Q_1. Given the labor-intensive nature of healthcare services, this transition would simultaneously influence the labor market for mental healthcare. In particular, hospitals and clinics would likely increase their employment of mental health professionals to meet the growing demand. Mental health therapists may also respond by working longer hours to take on more clients, or even opening their own private practices to accommodate the increased service needs. Consequently, I hypothesize positive effects of MHIP laws on these labor market outcomes among mental healthcare providers in the supply side, as well as the frequency of mental healthcare use in the demand side. By evaluating the effectiveness of MHIP laws in improving access to mental healthcare, the study can provide a comprehensive understanding of future policy implications.

3 Data

This paper constructs multiple samples using publicly available data from the Occupational Employment and Wage Statistics (OEWS), the Nonemployer Statistics (NES), and the Integrated Public Use Microdata Series of the Current Population Survey (IPUMS-CPS). These datasets allow for the observation of labor market outcomes for mental health therapists in each state during the period of MHIP law implementation. To enhance comparability, the analysis restricts the samples to include only mental and physical health practitioners.[5] In particular, mental health practitioners include psychologists, mental health counselors, mental health social workers, and psychiatrists. This sample restriction brings a clear delineation between treatment and control groups: the treatment group comprises mental health practitioners in states with MHIP laws, while the control group consists of physical health practitioners in all states and mental health practitioners in states without MHIP laws.

[5]In this analysis, mental and physical health practitioners are defined using the Standard Occupational Classification (SOC) system and include clinical, counseling, and school psychologists (19-3031), mental health counselors (21-1014), mental health and substance abuse social workers (21-1023), psychiatrists (29-1066), chiropractors (29-1011), dentists (29-1020), optometrists (29-1041), family and general practitioners (29-1062), internists (29-1063), obstetricians and gynecologists (29-1064), pediatricians (29-1065), surgeons (29-1067), other physicians (29-1069), podiatrists (29-1081), audiologists (29-1121), occupational therapists (29-1122), physical therapists (29-1123), radiation therapists (29-1124), recreational therapists (29-1125), respiratory therapists (29-1126), speech-language pathologists (29-1127), and other therapists (29-1129). Additionally, when using industry codes based on the North American Industry Classification System (NAICS), offices of physicians—mental health specialists (621112), offices of mental health practitioners except physicians (621330), offices of physicians except mental health specialists (621111), offices of dentists (621210), offices of chiropractors (621310), offices of optometrists (621320), and offices of physical, occupational and speech therapists, and audiologists (621340) are considered.

3.1 Sample Selection

OEWS. To analyze the employment effects of MHIP laws on mental health therapists at the extensive margin, this paper uses OEWS data from 1999 to 2008. The survey, conducted each May by the U.S. Bureau of Labor Statistics, is based on a rolling sample of approximately 1.1 million establishments collected over a three-year cycle. Establishments are drawn from the database of employer records submitted to state unemployment insurance programs. The OEWS covers wage and salary workers, excluding the self-employed, owners and partners in unincorporated firms, household workers, and unpaid family workers. It reports total employment and average wages by occupation across all 50 states and the District of Columbia. Since 1999, the data have included more granular occupation codes, enabling distinctions between mental and physical health practitioners.

NES. As the OEWS omits self-employed individuals, this paper supplements the analysis with NES data from 1997 and 2008 to examine self-employment outcomes at the extensive margin. Published annually each December by the U.S. Census Bureau since 1997, the NES is an administrative dataset derived from tax records and designed to capture small business dynamics and self-employment patterns. It provides information on establishments without any paid employees, which primarily represent sole proprietors and independent contractors; thus, in this dataset, each establishment corresponds directly to one self-employed individual. The data include total receipts and the number of establishments by 6-digit industry code at the county level. To preserve the representativeness of the sample in the analysis, missing or masked values are imputed only when they are unambiguously identifiable within the datasets.

IPUMS-CPS. Moreover, data from the Outgoing Rotation Group (ORG) of the IPUMS-CPS between 1990 and 2008 are primarily used for the analysis of the effects on weekly work hours at the intensive margin. The IPUMS-CPS, administered by the University of Minnesota, harmonizes microdata from monthly CPS surveys conducted jointly by the U.S. Census Bureau and the Bureau of Labor Statistics. The CPS samples over 65,000 households and follows a 4-8-4 rotation pattern, where these households are interviewed for four consecutive months, not interviewed for the next eight months, and then interviewed again for another four months. The ORG refers to households in their fourth and eighth interview months when they rotate out of the survey. The CPS provides individual-level records for the ORG on usual weekly work hours, weekly work hours in the previous week, occupation, industry, and state of residence, with the county code available from 1996 onward. Unfortunately, psychiatrists and other physicians are not distinguishable in this dataset. This dataset, nonetheless, is valuable for investigating heterogeneity in responses to MHIP laws among non-physician mental health therapists by demographic characteristics such as age, gender, and family composition. In particular, individual identifiers validated by the IPUMS-CPS facilitate tracking changes in labor

supply within individuals throughout the 4-8-4 rotating interview period.

3.2 Variable Description

This paper focuses on three outcome variables: employment, self-employment, and work hours. The total number of employed and self-employed mental health therapists measures the supply of mental healthcare services at the extensive margin. Since these counts are aggregated at the state and county levels in the OEWS and NES datasets, corresponding population estimates and unemployment rates are obtained from the U.S. Census Bureau and the Bureau of Labor Statistics, respectively. In addition, work hours refer to hours worked during the previous week among mental health therapists, as reported in the IPUMS-CPS. A set of individual-level covariates that may influence the outcome includes age, gender (female or male), race (Black or non-Black), ethnicity (Hispanic or non-Hispanic), marital status (married or unmarried), and the number of children under age 18 and under age 5.

Table 1 summarizes descriptive statistics for health practitioners in the treatment and control groups across the OEWS, NES, and IPUMS-CPS datasets. Columns (1), (2), and (3) reveal that, in the absence of MHIP laws, physical and mental health practitioners differ considerably. Physical health practitioners are likely to exhibit smaller employment size, earn higher wages and revenues, and work longer hours. In the OEWS sample (1999–2008), columns (2) and (3) show that mental health therapists in the treatment group report higher total employment than those in the control group, while annual and hourly wages are statistically indistinguishable. For the NES sample (1997–2008), the treatment group has greater levels of self-employment and higher total receipts than the control group, whereas average receipts per establishment are simliar. In the IPUMS-CPS sample (1990–2008), treated mental health therapists tend to work fewer hours on average. However, demographic characteristics, including gender, ethnicity, marital status, and number of children, are largely balanced between treatment and control groups. Interestingly, columns (3) and (4) show a decline in employment, self-employment, and work hours after MHIP implementation, although these differences are not statistically significant. These patterns highlight the importance of controlling for time-specific and geographic-specific shocks, as well as observable demographic characteristics, when estimating the impact of MHIP laws.

4 Econometric Strategy

This paper employs a two-way fixed effect (TWFE) model to empirically test the hypothesis that the MHIP laws positively impact the labor supply of mental health therapists. This analysis is based on a staggered treatment design, leveraging variation in the imple-

	Control		Treatment		P Value	
	(1) All	(2) Mental	(3) Before	(4) After	(2)-(3)	(3)-(4)
OEWS 1999-2008						
Total Employment	1,251	1,450	1,726	1,599	0.052	0.372
	(2,037)	(1,802)	(1,868)	(2,283)		
Annual Wages ($)	50,669	34,405	32,011	35,418	0.143	0.027
	(26,450)	(23,251)	(21,068)	(23,277)		
Hourly Wages ($)	24.360	16.541	15.390	17.028	0.143	0.027
	(12.716)	(11.178)	(10.128)	(11.191)		
Observations	7,650	654	244	1,071		
NES 1997-2008						
Establishments	31.666	17.914	30.805	29.691	0.000	0.504
	(145.89)	(61.37)	(124.88)	(134.58)		
Total Receipts ($1,000)	987	423	725	769	0.000	0.309
	(6,135)	(1,536)	(3,105)	(3,817)		
Receipts per Establishment ($1,000)	27.682	22.082	21.763	22.648	0.339	0.004
	(24.581)	(18.707)	(12.838)	(18.676)		
Observations	127,328	16,691	7,606	24,726		
IPUMS-CPS 1990-2008						
Ususal Hours Worked	44.319	37.403	36.304	35.742	0.038	0.278
	(16.023)	(11.275)	(11.469)	(12.534)		
Hours Worked in Previous Week	43.630	36.475	34.110	34.133	0.001	0.972
	(17.306)	(13.201)	(13.482)	(13.734)		
Age (years)	43.041	45.198	42.507	47.958	0.000	0.000
	(11.948)	(12.138)	(11.981)	(12.675)		
Female	0.436	0.611	0.638	0.665	0.183	0.149
	(0.496)	(0.488)	(0.481)	(0.472)		
Black	0.044	0.098	0.072	0.050	0.032	0.018
	(0.204)	(0.297)	(0.259)	(0.218)		
Hispanic	0.042	0.036	0.031	0.041	0.491	0.178
	(0.200)	(0.187)	(0.173)	(0.198)		
Married	0.746	0.604	0.586	0.640	0.374	0.005
	(0.435)	(0.489)	(0.493)	(0.480)		
Number of Children under Age 18	1.098	0.726	0.755	0.725	0.495	0.449
	(1.228)	(0.985)	(1.010)	(0.988)		
Number of Children under Age 5	0.273	0.153	0.195	0.148	0.032	0.012
	(0.590)	(0.454)	(0.482)	(0.452)		
Observations	43,207	943	1,428	1,179		

Table 1: Descriptive Statistics

mentation of the parity laws across states over time. The baseline specification for the employment effects using the OWES datasets is established as follows:

$$y_{ost} = \beta MHIP_{ost} + X_{st}\Gamma + \phi_o + \mu_s + \lambda_t + \epsilon_{st} \tag{1}$$

where the subscripts o, s and t denote occupation, state and time respectively. The dependent variable y_{ost} represents labor market outcomes such as the log number of total employment and average wages for occupation o in state s at time t. The variable of interest $MHIP_{ost}$ is a binary treatment indicator that captures whether state s implements parity laws and whether occupation o is directly affected by these laws at time t. Specifically, $MHIP_{ost}$ equals 1 if occupation o is a mental therapist and a full parity law is in effect in state s at time t, and 0 otherwise. Thus, $\beta > 0$ indicates that the parity laws has increased labor market outcomes for mental therapists. The vector X_{st} includes state-level covariates such as population and unemployment rates. This specification also incorporates occupation-fixed effects ϕ_o, state-fixed effects μ_s and time-fixed effects λ_t.

To effectively address zero-valued outcomes and interpret estimates as percentages using the NES datasets, the specification for the self-employment effects is extended to a Poisson regression model in this analysis (Chen and Roth, 2024). In the NES sample, the number of establishments in the industries of Offices of Mental Health Specialists (physicians) and Offices of Mental Health Practitioners (non-physicians) is often zero at the county level.

$$y_{jct} = \exp\Big(\beta MHIP_{jct} + X_{ct}\Gamma + \psi_j + \nu_c + \lambda_t\Big)\eta_{jct} \tag{2}$$

where the subscripts j, c, and t denote industry, county and time respectively. Here, the outcome variable y_{jct} includes the number of establishments and the total receipts for industry j in county c at time t. Similarly, $MHIP_{jct}$ is defined as 1 if industry j involves mental health care and a full parity law is in effect in county c at time t, and 0 otherwise. X_{st} is a vector of covariates at the county level, such as population and unemployment rates. This specification also controls for industry-fixed effects ψ_j, county-fixed effects ν_c, and time-fixed effects λ_t.

Also, the specification for the individual-level analysis of work hours is analogous to Equation 1 and 2.

$$y_{iost} = \beta MHIP_{ost} + X_{iost}\Gamma + \phi_o + \mu_s + \lambda_t + \xi_{iost} \tag{3}$$

where the subscripts i, o, s and t denote individual, occupation, state and time respectively. The dependent variable y_{iost} includes weekly work hours of individual i in occupation o within state s at time t. The binary treatment variable $MHIP_{ost}$ remains consistent with Equation 1. However, the covariate vector X_{iost} is more extensive, in-

cluding individual-level characteristics such as gender, race, ethnicity, age, age squared, marital status, and number of children. Similar to earlier specifications, occupation-fixed effects ϕ_o, state-fixed effects μ_s and time-fixed effects λ_t are considered.

Finally, to examine dynamic treatment effects, I conduct event study analyses based on equations 1, 2, and 3. However, recent advances in the econometric literature have shown that two-way fixed effects (TWFE) estimators may yield biased estimates when treatment effects are heterogeneous across time, due to the presence of negative weighting (de Chaisemartin and D'Haultfoeuille, 2020; Goodman-Bacon, 2021; Callaway and Sant'Anna, 2021; Sun and Abraham, 2021). In addition, compositional changes across treatment and control groups may distort event study estimates, leading to potentially misleading conclusions (Wing et al., 2024). To address these concerns, I conduct robustness checks using heterogeneity-robust estimators developed by Callaway and Sant'Anna (2021) and Cengiz et al. (2019).

5 Results

In this section, the estimated effects based on equations 1, 2, and 3 in the previous section are presented. Under the hypothesis of $\beta > 0$, mental health therapists would increase their supply in response to MHIP laws. By testing the hypothesis, the estimates will show whether MHIP laws effectively achieve their goal.

5.1 Extensive Margin

5.1.1 Employment

Table 2 presents the estimated effects of MHIP laws on the log number of total employment among mental health therapists. Columns (1) and (2) use the full sample from the OEWS data spanning 1999–2008, while columns (3) and (4) exclude states that have implemented MHIP laws prior to 1999 and are therefore always treated within the sample. The results indicate a positive but largely imprecise effect of MHIP laws on mental health therapist employment. In the trimmed sample, where statistical noise is smaller due to the exclusion of always-treated states, column (3) shows a statistically significant increase of 13.9% in employment following the implementation of MHIP laws. However, both the magnitude and statistical precision of the estimates in other specifications are smaller. Overall, these estimates suggest that MHIP laws slightly expand the mental healthcare workforce, though the effects appear sensitive to sample composition and model specification.

Table 3 examines the heterogeneous effects of MHIP laws on employment across four types of mental health therapists: psychologists, counselors, social workers, and psychiatrists. The estimates reveal no statistically significant changes in employment for any

of the subgroups. The coefficient for psychologists is positive (0.040), while those for counselors (0.006) and psychiatrists (0.010) are closer to zero. Surprisingly, the estimate for social workers is negative (-0.173), although also statistically insignificant. These results suggest that MHIP laws did not lead to a consistent or significant increase in total employment within each category. Despite the lack of precision, the aggregate effects observed in Table 2 may not be uniformly distributed across all types of mental health therapists. Instead, labor supply responses to MHIP laws may be disproportionate in specific types.

A notable increase in hourly wages among mental health therapists, however, supports the conceptual prediction that MHIP laws stimulate greater demand for mental healthcare services. As shown in Table 4, psychologists experience an hourly wage increase of approximately 5.9%. Other types of mental health therapists do not earn significantly more wages after MHIP laws. Nonetheless, the observed increase in wages for psychologists is consistent with growing demand for mental healthcare under expanded insurance coverage. Given the paucity of significant changes in overall employment, this wage growth may reflect a rising incentive for mental health therapists to open private clinics and transition into alternative work arrangements such as self-employment.

	(1)	(2)	(3)	(4)
Dependent Variable: log(Employment)				
MHIP	0.074	0.043	0.139**	0.048
	(0.047)	(0.048)	(0.047)	(0.048)
Sample	Untrimmed	Untrimmed	Trimmed	Trimmed
Fixed Effects				
State	✓		✓	
Occupation	✓		✓	
State × Occupation		✓		✓
Time	✓	✓	✓	✓
Covariates	✓	✓	✓	✓
Mean of Outcomes	1,317	1,317	1,336	1,336
Observations	9,040	9,027	6,652	6,642
Adjusted R^2	.888	.949	.886	.948

Notes: The state-level population is controlled as a covariate. Fixed effects vary across columns in this table. Standard errors are clustered at the state level and reported in parentheses.
* $p < .1$, ** $p < .05$, *** $p < .01$.

Table 2: Effects on Total Employment of Mental Health Therapists

	(1) Psychologists	(2) Counselors	(3) Social Workers	(4) Psychiatrists
Dependent Variable: log(Employment)				
MHIP	0.040	0.006	-0.173	0.010
	(0.066)	(0.076)	(0.107)	(0.158)
Mean of Dep. Var.	1,924	1,685	2,043	430
Observations	506	481	491	417
Adjusted R^2	.960	.921	.932	.903

Notes: The state-level population is controlled as a covariate. State-fixed and time-fixed effects are included. Standard errors are clustered at the state level and reported in parentheses.
* $p < .1$, ** $p < .05$, *** $p < .01$.

Table 3: Effects on Total Employment of Mental Health Therapists by Subgroup

	(1) Psychologists	(2) Counselors	(3) Social Workers	(4) Psychiatrists
Dependent Variable: log(Hourly Wage)				
MHIP	0.059**	0.028	-0.003	0.016
	(0.019)	(0.029)	(0.024)	(0.025)
Mean of Outcomes	26.788	17.120	16.979	66.421
Observations	509	491	506	453
Adjusted R^2	.841	.709	.825	.728

Notes: State-fixed and time-fixed effects are included. No other covariates are controlled in this table. Standard errors are clustered at the state level and reported in parentheses.
* $p < .1$, ** $p < .05$, *** $p < .01$.

Table 4: Effects on Hourly Wages of Mental Health Therapists by Subgroup

5.1.2 Self-Employment

Table 5 presents the estimated effects of MHIP laws on the number of private offices for mental healthcare, based on the NES datasets. Across all model specifications, the estimates robustly show a positive and significant relationship between MHIP laws and the number of establishments. In particular, column (1) of the untrimmed sample reports an increase of approximately 3.7 establishments. Similar magnitudes and levels of significance are observed in both trimmed and untrimmed samples with alternative fixed effects structures. These findings suggest that MHIP laws have incentivized the entry of mental health service providers, likely through the establishment of private practices. Taken together with the results from Table 2, which show limited changes in total employment,

these estimates imply a decrease in the average size of mental healthcare facilities. Given the evidence regarding the pronounced effects of MHIP laws on individuals with moderate mental distress (Andersen, 2015; Harris et al., 2006), these patterns may indicate an increase in mental health services, particularly for moderate symptoms rather than for more severe conditions.

Table 6 presents the estimated effects of MHIP laws on the number of self-employed mental health therapists by provider type. The results show that both offices of mental health specialists (physicians) and mental health practitioners (non-physicians) experienced statistically significant increases in the number of establishments following the implementation of MHIP laws. Specifically, the number of establishments owned by psychiatrists increased by 1.67 on average, while the number of establishments owned by psychologists and counselors rose by 3.18. This means that there is heterogeneity in self-employment responses to MHIP laws among mental health therapists. MHIP laws have a particularly pronounced effect among non-physician mental health therapists.

Figure 3 illustrates event study estimates of the effects of MHIP laws on the number of self-employed mental health therapists by provider type. The figure reveals clear upward trends in self-employment among both physician and non-physician mental health therapists following the implementation of MHIP laws. MHIP laws effectively reverse weakly decreasing pre-trends prior to the policy changes. These patterns reinforce the findings in Table 6, providing dynamic evidence that MHIP laws prompted the expansion of self-employment in the mental healthcare sector. Notably, the increase appears more immediate and sustained for non-physician mental health therapists, suggesting they are more likely to increase their supply.

Figure 4 provides a limited yet informative insight into the potential improvement in mental healthcare utilization. The figure displays event-study estimates of the effects of MHIP laws on total receipts among self-employed mental health therapists, disaggregated by provider type. The estimates reveal a clear upward trend in total receipts following the implementation of MHIP laws, with the increase becoming more pronounced over time. While this pattern indicates heightened market size, it does not definitively imply growth in the quantity of services supplied, as revenues reflect both price and quantity dimensions. Nonetheless, given the high demand elasticity of mental healthcare (Manning et al., 1986), it is more plausible that the rise in receipts reflects an increase in the number of visits, rather than price effects alone. This interpretation suggests that MHIP laws may have facilitated greater utilization of outpatient mental health services, particularly among self-employed providers.

	(1)	(2)	(3)	(4)
Dependent Variable: Establishments				
MHIP	3.676**	1.971**	3.342**	1.910**
	(1.364)	(0.656)	(1.558)	(0.657)
Sample	Untrimmed	Untrimmed	Trimmed	Trimmed
Fixed Effects				
County	✓		✓	
Industry	✓		✓	
County × Industry		✓		✓
Time	✓	✓	✓	✓
Covariates	✓	✓	✓	✓
Mean of Outcomes	25.143	25.143	25.970	25.970
Observations	155,582	154,755	142,037	141,283
Adjusted R^2	.626	.988	.627	.988

Notes: The county-level population is controlled as a covariate. Fixed effects vary across columns in this table. Standard errors are clustered at the county level and reported in parentheses.
* $p < .1$, ** $p < .05$, *** $p < .01$.

Table 5: Effects on Self-Employment of Mental Health Therapists

	(1) Mental Health Specialists (Physicians)	(2) Mental Health Practitioners (Non-Physicians)
Dependent Variable: Establishments		
MHIP	1.668***	3.179**
	(0.496)	(1.043)
Mean of Outcomes	14.037	40.145
Observations	24,163	22,374
Adjusted R^2	.982	.987

Notes: The county-level population is controlled as a covariate. County-fixed and time-fixed effects are included. Standard errors are clustered at the county level and reported in parentheses.
* $p < .1$, ** $p < .05$, *** $p < .01$.

Table 6: Effects on Self-Employment by Subgroup

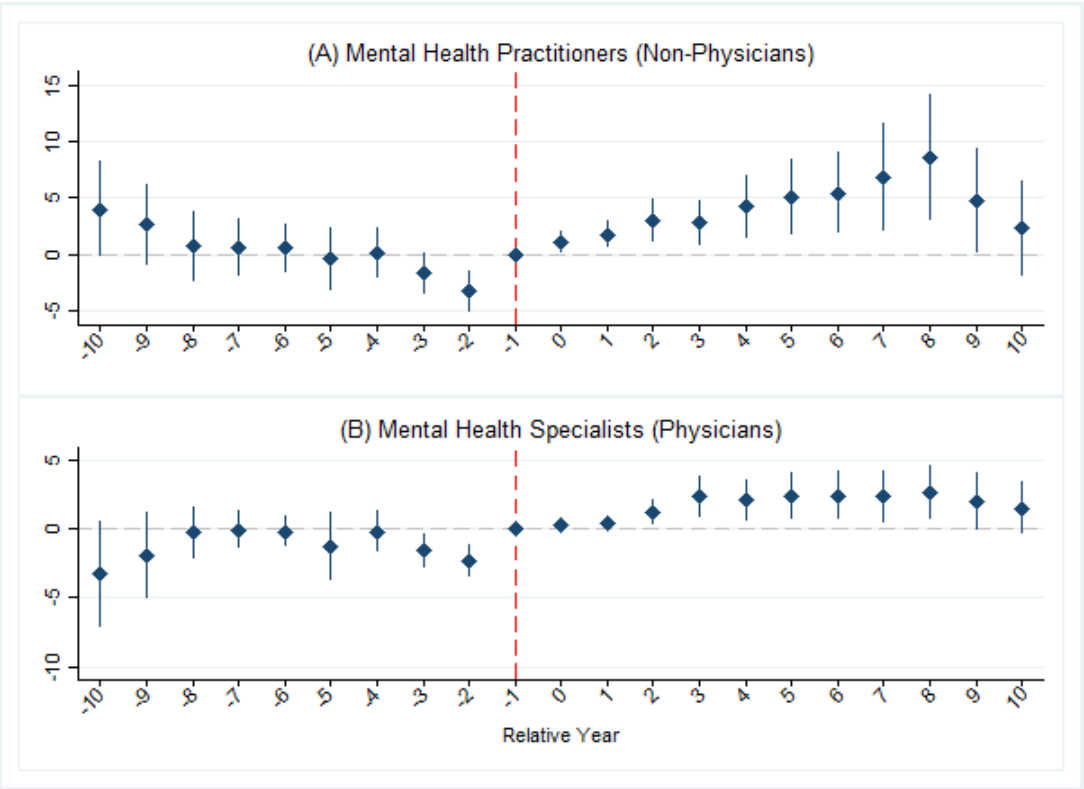


Figure 3: Event Studies on Self-Employment by Subgroup

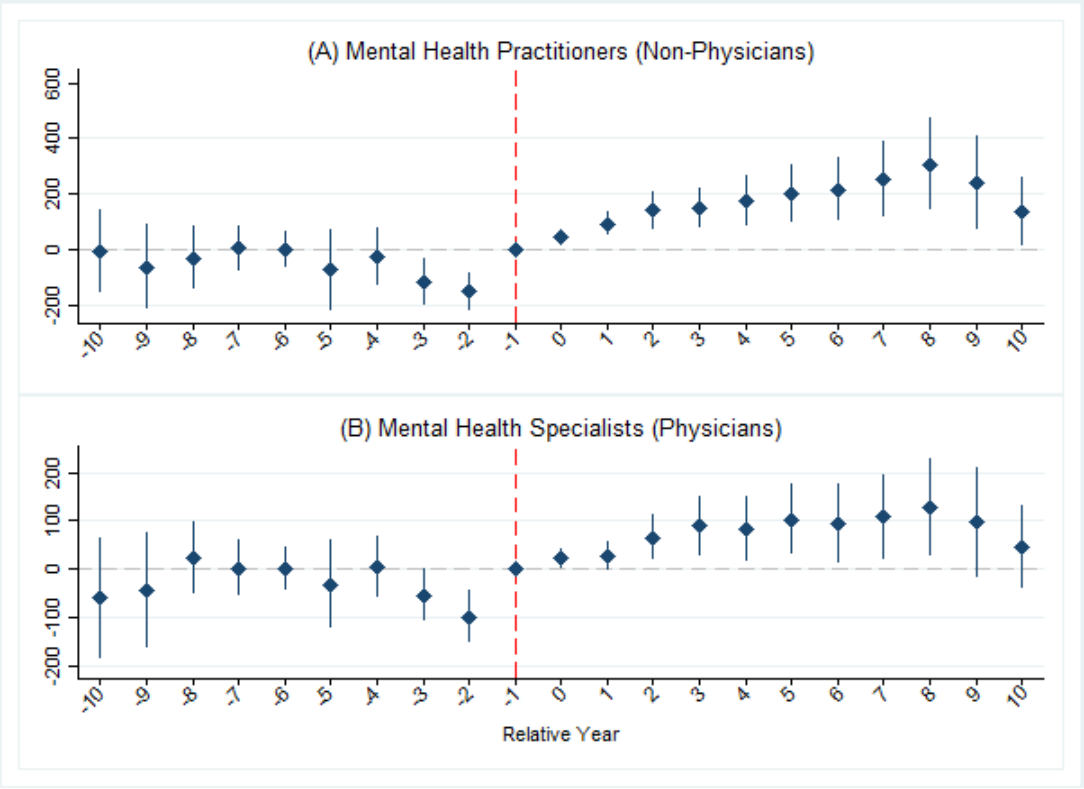


Figure 4: Event Studies on Total Receipts by Subgroup

5.1.3 Subsample Analyses

Next, I examine which subgroups of mental health therapists are more likely to respond to the increased demand for mental healthcare due to MHIP laws. For example, I investigate whether older therapists were delaying retirement or whether younger therapists were entering the market. To this end, I calculate the proportions of therapists who are over the age of 55, under the age of 35, married women, or parents of children under the age of 5 at the state level over time. Due to limited sample sizes within each state, these subgroup proportions may suffer from measurement error, which could attenuate the estimated effects of MHIP laws toward zero. Consequently, the estimates reported in this analysis could be interpreted as lower bounds of the true effects.

Table 7 explores whether the composition of the mental health therapist workforce changed following the implementation of MHIP laws by examining age, gender, marital status, and parental status. The estimates reveal no statistically significant shifts in the age distribution or gender composition of non-physician therapists. However, notable changes are observed in parental status: the share of therapists with children under age 5 declines by 4.1 percentage points, while the share with children aged 6 to 18 increases by 5.9 percentage points. These results suggest that MHIP laws may have drawn increased labor supply from individuals with older children, who likely face fewer caregiving constraints, while deterring participation among those with very young children. This pattern is consistent with the hypothesis that therapists with greater time flexibility are more likely to respond to expanding demand under MHIP laws.

	(1)	(2)	(3)
Dependent Variable: Proportions			
(A) Age			
	Aged under 34	Aged 35 to 54	Aged over 55
MHIP	-0.039	0.035	0.004
	(0.027)	(0.027)	(0.020)
Mean of Outcomes	0.325	0.507	0.168
(B) Gender and Marital Status			
	Married Women	Unmarried Women	Men
MHIP	-0.030	0.008	0.022
	(0.021)	(0.025)	(0.022)
Mean of Outcomes	0.409	0.297	0.294
(C) Parenthood			
	Children under 5	Children 6 to 18	No Children under 18
MHIP	-0.041**	0.059**	-0.017
	(0.019)	(0.026)	(0.028)
Mean of Outcomes	0.325	0.507	0.168

Notes: The number of observations is 1,903. State-fixed and time-fixed effects are included. Standard errors are clustered at the state level and reported in parentheses.
* $p < .1$, ** $p < .05$, *** $p < .01$.

Table 7: Distribution Changes among Non-Physician Mental Health Therapists

5.2 Intensive Margin

Table 8 presents the estimated effects of MHIP laws on the weekly work hours of non-physician mental health therapists, capturing responses at the intensive margin. The results indicate a consistent and statistically significant increase in work hours across multiple specifications. In particular, columns (2) and (4) show that MHIP laws are associated with increases of 4.3% and 5.6%, respectively, in weekly hours worked. These findings suggest that, beyond influencing entry into the profession, MHIP laws also intensify labor supply among existing mental health providers, who respond by working longer hours. This also aligns with the theoretical prediction regarding the increased demand for mental healthcare services under expanded insurance coverage.

Figure 5 presents event-study estimates of the effects of MHIP laws on the log of weekly work hours among non-physician mental health therapists. The figure shows a clear upward shift in weekly work hours following the implementation of MHIP laws. The increase in hours becomes evident shortly after the laws take effect and remains persistent over time. These dynamic patterns corroborate the results reported in Table

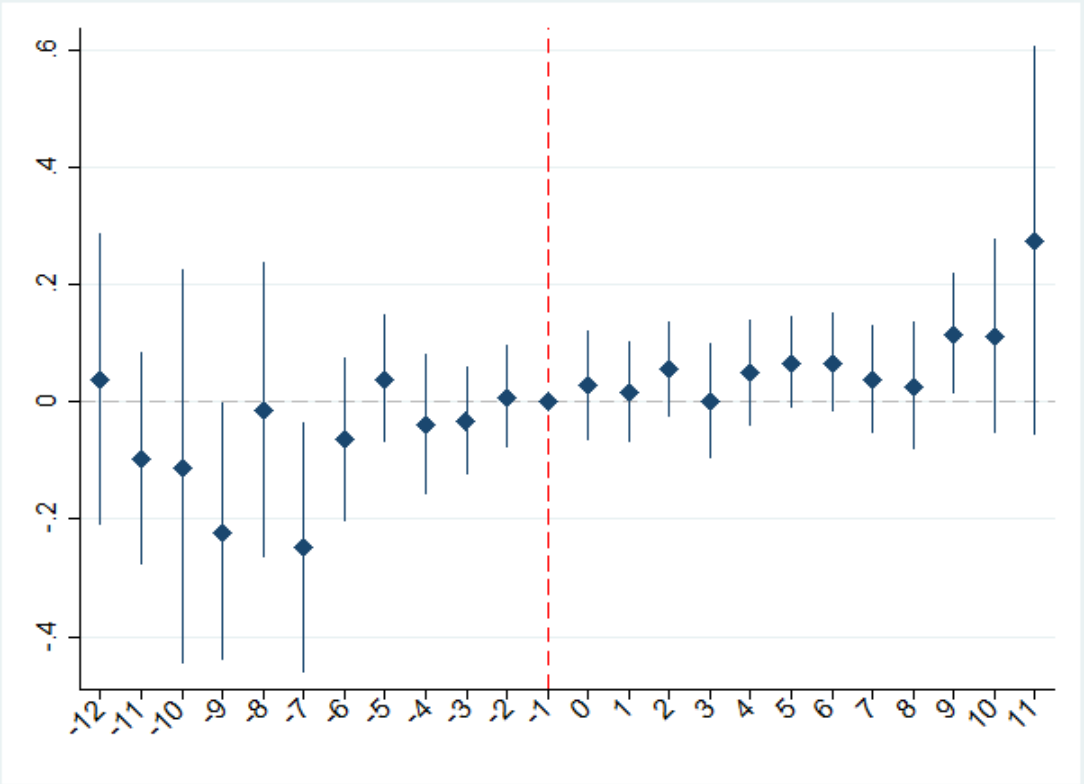
8, reinforcing the interpretation that MHIP laws led to increased labor supply of mental health therapists at the intensive margin.

	(1)	(2)	(3)	(4)
Dependent Variable: log(Hour)				
MHIP	0.010	0.043**	0.010	0.056**
	(0.014)	(0.019)	(0.015)	(0.025)
Fixed Effects				
State	✓			
County			✓	
Occupation	✓		✓	
State × Occupation		✓		
County × Occupation				✓
Time	✓	✓	✓	✓
Covariates	✓	✓	✓	✓
Mean of Outcomes	42.335	42.335	42.208	42.208
Observations	38,484	38,484	34,501	34,501
Adjusted R^2	.173	.177	.174	.190

Notes: Covariates include gender, race, ethnicity, age, age squared, marital status, and number of children aged below 18. Fixed effects vary across columns in this table. Standard errors are bootstrapped and reported in parentheses.

* $p < .1$, ** $p < .05$, *** $p < .01$.

Table 8: Effects on Weekly Work Hours of Mental Health Therapists



Notes: Covariates include gender, race, ethnicity, age, age squared, marital status, and number of children aged below 18. Fixed effects are controlled. Standard errors are bootstrapped.
* $p < .1$, ** $p < .05$, *** $p < .01$.

Figure 5: Event Study on the Log Weekly Work Hours

6 Discussion

Several extensions are planned to further strengthen this study. First, I will supplement the analysis using restricted-access datasets that contain detailed information on healthcare utilization, such as the Medical Expenditure Panel Survey (MEPS), to observe the total volume of mental healthcare services delivered. Whether MHIP laws lead to an actual increase in service quantity on the demand side remains somewhat unclear. Second, I will investigate whether MHIP laws merely lead to a zero-sum redistribution of existing mental health providers across states or contribute to a positive-sum creation of providers. This analysis will focus on patterns of interstate migration among mental health therapists by comparing provider inflows and outflows across states with and without parity laws. Third, I will finalize robustness checks for the event study specifications to ensure that the dynamic treatment effects are not biased by negative weighting or compositional changes.

7 Conclusion

This paper investigates the impact of Mental Health Insurance Parity (MHIP) laws on the supply of mental health services in the United States. Using a staggered difference-in-differences design, the analysis provides new evidence on how these mandates influence mental healthcare providers along both the extensive and intensive margins. The results indicate that MHIP laws lead to a modest increase in the total employment of mental health therapists. More significantly, the laws stimulate self-employment, particularly among non-physician mental health therapists such as psychologists and counselors. These findings suggest that the expansion of insurance coverage under MHIP laws has facilitated provider entry primarily through the establishment of private practices, rather than through employment in larger hospitals or clinics.

In addition to changes in provider headcounts, MHIP laws are found to raise the average number of weekly hours worked by mental health therapists. This intensive-margin response implies that existing providers are supplying more services, likely in response to increased healthcare demand driven by improved affordability. Additionally, the increase in work hours remains steady after the laws are implemented.

This paper offers policy implications aimed at addressing the persistent disparity between mental and physical healthcare in the contemporary United States. Although MHIP laws were designed to improve access to mental healthcare through more equitable insurance coverage, their effectiveness ultimately hinges on the capacity of the provider market to accommodate increased demand. Demographic analyses suggest that the observed increases in the supply of mental health services are primarily driven by existing therapists re-entering the labor market rather than by an influx of newly trained professionals. To further improve access, policies may be required to address structural barriers within the entire system, including workforce pipeline development, reimbursement incentives, and enhanced provider network participation. This study provides a foundation for understanding how insurance expansions attract mental health professionals and finally invites further research into the downstream effects on health outcomes.

A Supplementary Tables and Figures

	(1)	(2)	(3)	(4)
Dependent Variable: Establishments				
MHIP	0.078**	0.019**	0.050*	0.018**
	(0.026)	(0.009)	(0.027)	(0.009)
Sample	Untrimmed	Untrimmed	Trimmed	Trimmed
Fixed Effects				
County	✓		✓	
Industry	✓		✓	
County × Industry		✓		✓
Time	✓	✓	✓	✓
Covariates	✓	✓	✓	✓
Mean of Outcomes	25.143	25.143	25.970	25.970
Observations	122,910	73,169	112,761	67,232
Pseudo R^2	.950	.970	.952	.971

Notes: The county-level population is controlled as a covariate. County-fixed and time-fixed effects are included. Standard errors are clustered at the county level and reported in parentheses.
* $p < .1$, ** $p < .05$, *** $p < .01$.

Table 9: Poisson Effects on Self-Employment of Mental Health Therapists

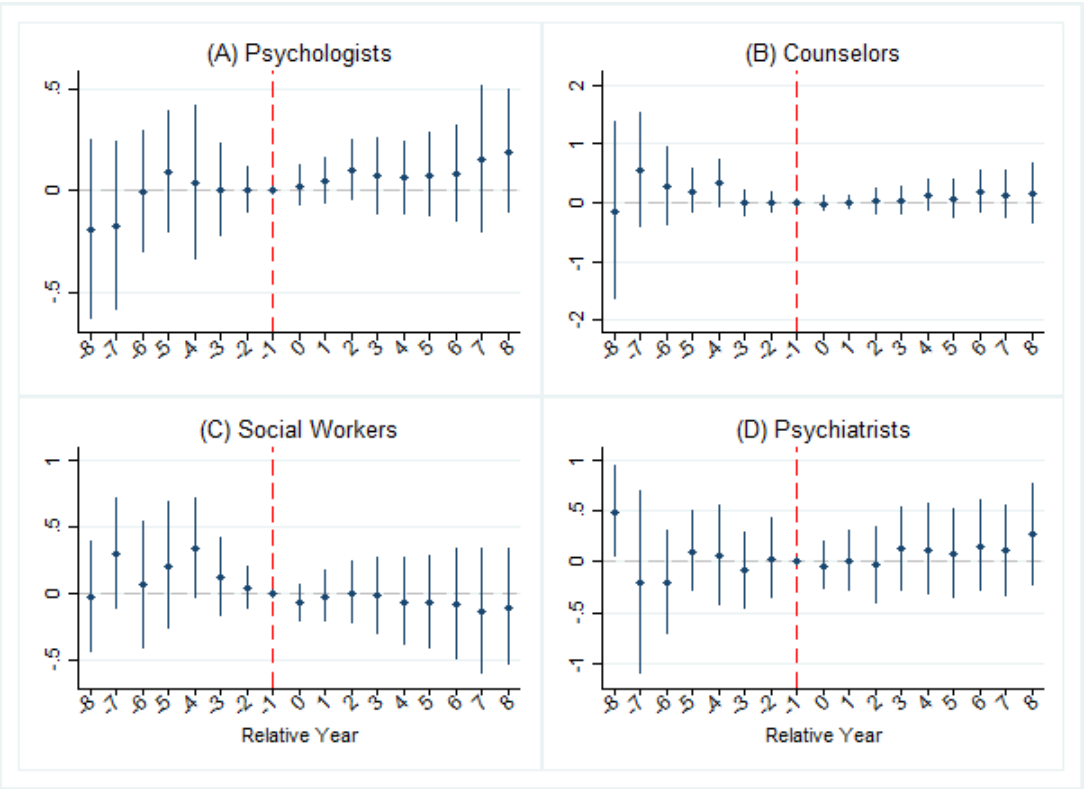


Figure 6: Event Studies on the Log Employment by Subgroup

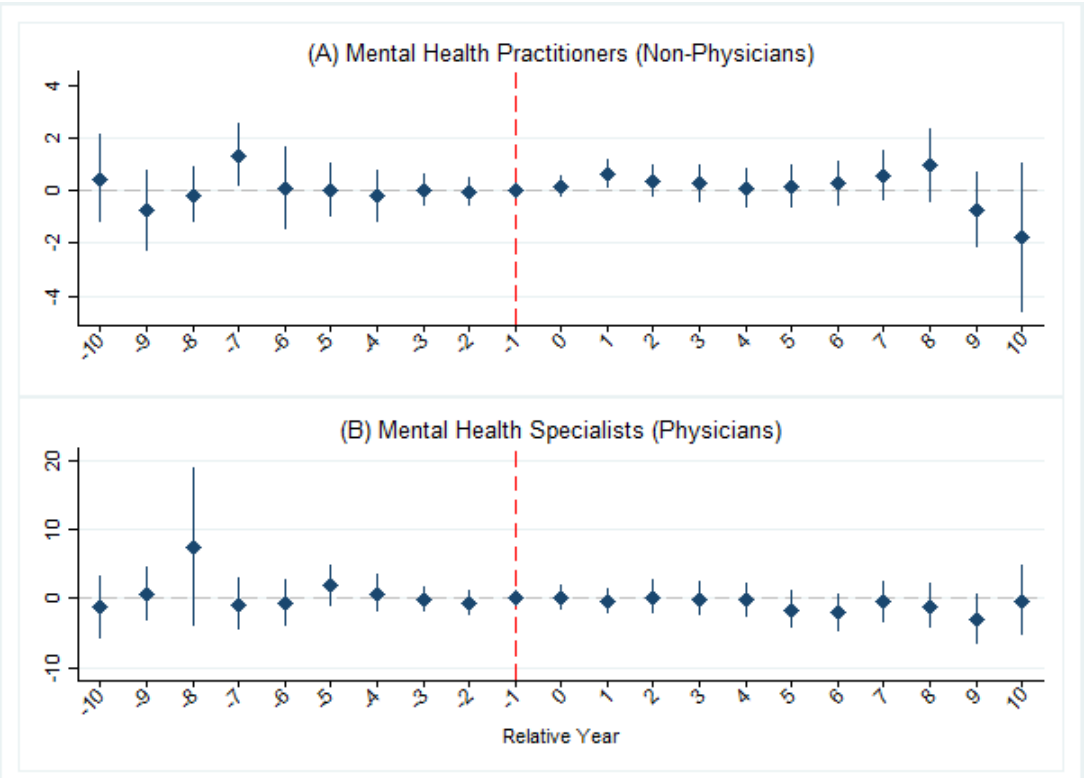


Figure 7: Event Studies on Receipts per Establishment by Subgroup

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