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Do Family Policies Work for Women ?

A Global Analysis of Parental Leave, Cultural Norms, and Labor Force Partecipation

(1990-2023)

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Abstract

This thesis investigates the impact of parental leave policies on female labor force participation through a comparative global analysis. Using a panel of 178 countries from 1990 to 2023, a combination of fixed effects models, event studies, and staggered Difference-in-Differences estimators is applied to isolate causal effects. The analysis focuses on three dimensions: the relative effectiveness of maternity versus paternity leave, the moderating role of gender norms, and non-linearities across income levels.

Results show that paternity leave generates long-term gains in women's labor market participation, while maternity leave has short-term, often insignificant effects. Shared parental leave provisions are found to be ineffective. The impact of paternity leave is stronger in more gender-equal societies and at both high and low levels of economic development, revealing important heterogeneity across contexts.

The main contribution lies in identifying the marginal policy drivers that sustain long-run gender equality in labor markets. In particular, targeting fathers—through design features such as non-transferable quotas—yields significantly larger gains than expanding maternity entitlements. These findings have important implications for the design of family policy worldwide[1].

[1] In the preparation of this thesis, generative artificial intelligence tools were used solely as linguistic support for the revision and improvement of the English language. The content, arguments, and sources remain entirely the responsibility of the author.

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1 Introduction

Despite major gains in education, women remain underrepresented in the global labor market—especially after childbirth. Closing this gap is not only a question of fairness, but a prerequisite for inclusive growth (World Bank, 2024; Goldin, 2023)[2]. When societies fully leverage women's skills and talents, they benefit from a more diverse workforce, greater innovation, and stronger economic resilience (Bjerde & Gill, 2024; Doepke et al., 2023)[3]. Yet despite decades of legal reform, large cross-country disparities in FLFP (female labor force participation) persist—especially around childbearing years. The "motherhood penalty" remains a significant barrier to women's full economic participation (Kleven et al., 2019; ILO, 2023)[4].

In recent years, parental leave policies have emerged as a promising tool to address gender gaps in labor market outcomes. Expanding entitlements to include fathers is increasingly seen as a strategy to promote shared caregiving and reduce the disproportionate career cost of motherhood (Kamerman, 2000; Gornick & Meyers, 2003)[5]. However, legislation alone is not sufficient. Policy effectiveness depends on enforcement capacity, social norms, and institutional incentives. While Nordic countries have succeeded through "daddy quotas"

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[2] World Bank. (2024). *Women, Business and the Law 2024*. Washington, DC: World Bank.- Goldin, C. (2023). *Career and Family: Women's Century-Long Journey toward Equity*. Princeton University Press.

[3] Bjerde, A., & Gill, I. (2024). *Breaking the Mold: Women, Work, and Economic Transformation in the Middle East and North Africa*. Washington, DC: World Bank.- Doepke, M., Tertilt, M., & Voena, A. (2023). *The Economics of Parenting*. In *Handbook of Labor Economics* (forthcoming).

[4] Kleven, H., Landais, C., & Søgaard, J. E. (2019). *Children and Gender Inequality: Evidence from Denmark*. American Economic Journal: Applied Economics, 11(4), 181–209.- International Labour Organization (ILO). (2023). *Care at Work: Investing in care leave and services for a more gender-equal world of work*. Geneva: ILO.

[5] Kamerman, S. B. (2000). *Parental Leave Policies: An Essential Ingredient in Early Childhood Education and Care Policies*. Social Policy Report**,** 14(2), 3–15.- Gornick, J. C., & Meyers, M. K. (2003). *Families That Work: Policies for Reconciling Parenthood and Employment*. New York: Russell Sage Foundation.

and strong uptake mechanisms (Andersen, 2018), in many settings, gender inequalities persist and father take-up remains low[6].

This thesis contributes to the literature on gender and labor markets by providing a global panel analysis of the causal effects of parental leave policies on FLFP, covering 178 countries from 1990 to 2023. Whereas prior studies (e.g., Olivetti & Petrongolo, 2017; Kleven et al., 2019) focus on OECD or single-country settings, this work expands the empirical scope and applies a multi-method identification strategy, combining two-way fixed effects, event studies, and staggered Difference-in-Differences (DiD) models (Callaway & Sant'Anna, 2021)[7]. This approach addresses key limitations in the literature, including homogeneous treatment timing and untested effect heterogeneity.

The analysis is guided by three hypotheses:

- **H1.** *Paternity leave has a stronger and more robust positive effect on FLFP than maternity leave.*
- **H2.** *The effectiveness of parental leave policies is moderated by gender norms: their impact is stronger in countries with lower levels of gender bias (as measured by GSNI).*
- **H3.** *The labor market impact of parental leave policies varies non-linearly with economic development, showing heterogeneous effects across income levels.*

These hypotheses reflect theoretical mechanisms related to statistical discrimination, caregiving redistribution, and policy uptake conditioned by social norms and institutional environments. To test these hypotheses, the thesis introduces novel interaction models with the Gender Social Norms Index (GSNI) and GDP per capita, highlighting how policy

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[6] Andersen, S. H. (2018). *Paternity leave and the gender wage gap: Evidence from Denmark*. Labour Economics**,** 55, 141–153.

[7] Callaway, B., & Sant'Anna, P. H. C. (2021). *Difference-in-Differences with Multiple Time Periods*. Journal of Econometrics**,** 225(2), 200–230.

outcomes depend on both legal design and normative context. A counterfactual simulation shows that if all countries shared Sweden's egalitarian gender norms, the labor market impact of parental leave policies would be significantly stronger.

Empirical findings strongly support these hypotheses. In line with H1, paternity leave shows a more consistent and long-term association with FLFP, especially in egalitarian and high-capacity contexts. H2 is confirmed through interaction models with the Gender Social Norms Index (GSNI), which reveal that leave policies are more effective where gender bias is lower. H3 is supported by evidence of non-linear patterns: maternity and paternity leave are most effective at different stages of economic development, while shared parental leave displays limited effects unless specifically designed to promote father take-up.

Methodologically, the thesis contributes to the emerging use of staggered DiD estimators in cross-national gender research—a tool still rare in global policy evaluation. Substantively, it offers policy-relevant insights into when and where parental leave reforms are most effective, emphasizing the need to align legal change with cultural and institutional transformation.

The thesis is structured as follows:

- **Chapter 2** reviews the theoretical literature on gender, care, and labor policy;
- **Chapter 3** presents the data and empirical methods;
- **Chapter 4** reports the main results, robustness checks, and heterogeneity analysis;
- **Chapter 5** concludes with policy implications and future research directions.

This structure allows for a rigorous integration of theoretical insights, empirical data, and methodological tools to answer a central question: *Under what conditions do parental leave policies effectively promote female labor force participation?*

2 Theoretical Framework and Hypotheses

2.1 Parental leave and female labor supply: background and relevance

Over the past decades, parental leave policies have become a core element of welfare systems aimed at supporting families and promoting gender equality in the labor market. Initially designed to protect maternal and infant health, they have evolved to address broader goals such as employment continuity, income security, and shared caregiving (Kamerman, 2000) [8] . This evolution reflects major socio-demographic changes, particularly the sustained growth in female labor force participation (FLFP) during the second half of the 20th century.

In the United States, for example, the share of mothers with infants in the labor force rose from 27 percent in 1970 to nearly 60 percent by the late 1990s (Bureau of Labor Statistics, 2000)[9]. Across OECD countries, the expansion of female employment has gone hand in hand with efforts to improve work–family reconciliation, suggesting a mutually reinforcing relationship between policy development and labor market trends (Olivetti & Petrongolo, 2017). [10] Within this broader context, the expansion of parental leave legislation—including maternity, paternity, and shared entitlements—has emerged as a key instrument to mitigate the long-term economic costs of motherhood.

The first statutory maternity leave laws emerged in Europe in the late 19th century, culminating in ILO Convention No. 3 (1919), which guaranteed 12 weeks of job-protected leave[11]. Subsequent revisions extended these standards, but a major turning point came in

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[8] Kamerman, Sheila B. 2000. "Parental Leave Policies: An Essential Ingredient in Early Childhood Education and Care Policies." *Social Policy Report* 14(2): 3–15.

[9] Bureau of Labor Statistics. 2000. *Employment Characteristics of Families*. Washington, DC: U.S. Department of Labor.

[10] Olivetti, Claudia, e Barbara Petrongolo. 2017. "The Economic Consequences of Family Policies: Lessons from a Century of Legislation in High-Income Countries." *Journal of Economic Perspectives* 31(1): 205–230.

[11] International Labour Organization (ILO). 2004. *Maternity Protection Convention No. 183 and Recommendation No. 191: Key Provisions and Developments*. Geneva: ILO.

the 1970s. Countries like Sweden pioneered gender-neutral parental leave and paternity entitlements, aiming to redistribute care work and promote labor market attachment for women (Kamerman, 2000; Olivetti & Petrongolo, 2017).

Despite global policy diffusion, parental leave systems remain deeply gendered. According to the World Bank (2024), women receive an average of 196 days of paid leave versus just 25 for men[12]. Maternity leave is often only partially funded, and legal protections against dismissal are inconsistently enforced. These disparities reflect both institutional limitations and enduring social norms around caregiving.

Importantly, improvements in legal entitlements have not translated into equivalent gains in labor market outcomes. While women now surpass men in educational attainment across most high-income countries, FLFP has stagnated. Global ILO estimates show a persistent gender gap of 30 percentage points among adults aged 25–54 (ILO, 2023)[13].

This pattern reflects what scholars term the "unfinished gender revolution" (Goldscheider et al., 2015): a disconnect between formal gains in rights and the slow transformation of domestic roles and labor market institutions[14]. Parental leave policies sit at the center of this paradox. Their effectiveness in promoting gender equality depends not only on coverage and duration, but also on design features, institutional context, and cultural uptake (Olivetti & Petrongolo, 2017).

These tensions raise several fundamental questions: Why have expanded parental leave rights not produced consistent gains in women's employment? Under what conditions can these policies become truly effective? And how do design features and gender norms

[12] World Bank**.** (2024). *Women, Business and the Law 2024 – Historical Panel Dataset*. Retrieved from https://wbl.worldbank.org/en/wbl-data

[13] International Labour Organization (ILO). 2023. *New Data Shine Light on Gender Gaps in the Labour Market: Spotlight on Work Statistics No. 12*. Geneva: ILO.

[14] Goldscheider, Frances, Eva Bernhardt, e Trude Lappegård. 2015. "The Gender Revolution: A Framework for Understanding Changing Family and Demographic Behavior." *Population and Development Review* 41(2): 207–239.

mediate their impact? These questions form the theoretical and empirical foundation of this research. The next section outlines the main mechanisms—both enabling and constraining—through which parental leave policies affect women's labor market participation.

2.2 Channels of influence: theoretical mechanisms

This section explores the theoretical mechanisms through which parental leave policies shape female labor market participation. The analysis is organized around both supply-side and demand-side dynamics, highlighting how institutional arrangements, economic incentives, and social norms interact to influence women's employment decisions and employers' behaviors. By unpacking these channels, the section aims to clarify the conditions under which family policies can promote—or hinder—gender equality in labor market outcomes. Table 2.1 provides a summary of these supply- and demand-side mechanisms.

DEMAND-SIDE MECHANISMS

Two main demand-side mechanisms can be identified: first, the role of employer bias and statistical discrimination; second, the institutional constraints that shape firms' hiring behavior in the presence of wage rigidities and imperfect competition.

2.2.1 Statistical Discrimination and Employer Bias

Parental leave policies significantly influence employers' hiring decisions and management practices by affecting the costs firms face. When a substantial portion of leave-related costs—direct or indirect—is borne by employers, women of childbearing age are often perceived as more likely to take extended absences, increasing their expected cost to firms. This perception leads to statistical discrimination, where female workers are

viewed as less productive or more costly than males, reinforcing gender stereotypes and occupational disadvantages (Albanesi & Olivetti, 2020)[15].

Conversely, policies promoting continuous labor market attachment for mothers—such as job protection, structured return-to-work programs, and incentives for fathers' leave sharing—can positively shift employer expectations. When maternity is not associated with prolonged or solely female career breaks, hiring women becomes less risky, fostering more neutral or favorable attitudes towards female employees.

2.2.2 Wage Rigidity and Employment Adjustments

The employment effects of parental leave policies are ambiguous, especially in contexts with wage rigidities. Olivetti and Petrongolo (2017) highlight that when wage floors (e.g., collective agreements, minimum wages, equal pay laws) prevent wage adjustments in response to productivity risks, firms may reduce female employment rather than wages to absorb increased costs. Wage elasticity is crucial: in markets with inelastic demand for female labor, cost increases have limited effects; with elastic female labor supply, especially among caregiving mothers, job losses risk rises.

In non-competitive or monopsonistic labor markets—characterized by upward-sloping labor supply curves—firms possess wage-setting power and may pay workers less than their marginal productivity (Manning, 2003)[16]. This wage–productivity gap allows firms to absorb family policy costs without cutting employment, a phenomenon often more pronounced for women, whose labor supply is typically less wage-elastic due to caregiving responsibilities. Under these conditions, well-designed family policies can reinforce female labor market attachment without adverse employment consequences.

The effects of such policies also vary across individuals and sectors. Industries valuing continuous experience and with low turnover may see positive cumulative employment

[15] Albanesi, S., & Olivetti, C. (2020). *Gender Roles and Medical Progress*. *Journal of Political Economy*, 128(3), 1071–1124. https://doi.org/10.1086/705554

[16] Manning, A. (2003). *Monopsony in Motion: Imperfect Competition in Labor Markets*. Princeton University

returns. Conversely, policies that reinforce traditional caregiving risk entrenching biases and occupational segregation. Overall, the net employment impact depends on the interaction between labor market institutions, employer behavior, and women's constraints.

SUPPLY-SIDE MECHANISMS

Parental leave policies also affect women's participation in the labor force through several supply-side factors. These mainly work by influencing the incentives and barriers women face when deciding to enter, stay in, or leave the workforce. By helping balance work and family life, preserving human capital, and shaping household decisions about costs and benefits, supply-side effects are crucial in determining how effective family policies are and their long-term impact. The following subsections examine these mechanisms in detail.

2.2.3 Work–Family Reconciliation

One of the primary ways parental leave policies influence female labor force participation is by easing family-related constraints, particularly the challenge of balancing paid work and caregiving responsibilities. As noted in Section 2.1, the earliest forms of maternity leave were primarily aimed at protecting maternal health and preserving women's employment relationships after childbirth.

Maternity leave thus became a key policy tool for safeguarding job continuity during a particularly vulnerable phase in women's career trajectories (OECD, 2017).[17]

Over time, family policies have evolved to include paternity and shared parental leave, aiming to redistribute caregiving more equitably within households. When fathers take leave, the domestic workload on mothers is alleviated, which supports women's sustained labor market engagement (Olivetti & Petrongolo, 2017). Evidence from countries with non-transferable leave quotas for fathers—especially in Nordic contexts—shows lasting

[17] OECD (2017). *The Pursuit of Gender Equality: An Uphill Battle*. OECD Publishing.

positive impacts on caregiving involvement, child wellbeing, family cohesion, and workplace gender equality (Nordic Council of Ministers, 2019[18]; OECD, 2017[19]).

Understanding these policies' importance also requires recognizing the substantial economic value of unpaid care work, predominantly performed by women and often excluded from official economic measures. This invisible labor, equivalent to services that would otherwise require market transactions, can exceed 20% of GDP in many countries, presenting a significant barrier to women's paid employment and reinforcing gender inequality (Becker, 1965; OECD, 2011; Woetzel et al., 2015)[20].

These dynamics can be situated within a wider theoretical framework. Becker (1985) argued that the gendered division of labor within households is shaped by strategic specialization.[21] When human capital yields increasing returns, families tend to allocate market-oriented investment to one member—typically the man—while the other, usually the woman, assumes responsibility for home production, which is more effort-intensive. This dynamic discourages women from fully investing in their careers, pushing them toward jobs that fit family roles but limit earnings and advancement.

Parental leave policies are designed to intervene on both fronts. On one hand, they alleviate the economic and logistical constraints imposed by unpaid care work, through adequate wage replacement and supportive services. On the other hand, they challenge the specialization equilibrium described by Becker, offering women a viable path to remain continuously engaged in the labor market.

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[18] Nordic Council of Ministers (2019). *Barriers to Parental Leave for Fathers in the Nordic,* OECD (2017). *The Pursuit of Gender Equality: An Uphill Battle*. OECD Publishing

[19] OECD (2017). *The Pursuit of Gender Equality: An Uphill Battle*. OECD Publishing.

[20] OECD (2011). *Doing Better for Families*. OECD Publishing. Woetzel, J., Madgavkar, A., Ellingrud, K., Labaye, E., Devillard, S., Kutcher, E., Manyika, J., Dobbs, R., & Krishnan, M. (2015). *The Power of Parity: How Advancing Women's Equality Can Add $12 Trillion to Global Growth*. McKinsey Global Institute.

[21] Becker, G. S. (1985). *Human Capital, Effort, and the Sexual Division of Labor*. Journal of Labor Economics, 3(1, Part 2), S33–S58.

2.2.4 Human Capital, Economic Incentives, and Household Decisions

Another key mechanism through which parental leave policies influence female labor force participation lies in the economic incentives built into their design. Two critical dimensions—duration and compensation—shape whether women stay attached to the workforce or exit after childbirth.

On one hand, long periods of poorly paid or unpaid leave, especially when not supported by flexible work arrangements or affordable childcare, can push women out of the labor market for extended periods. These career interruptions often result in human capital depreciation, slower wage growth, and occupational downgrading. As theorized by Mincer (1974)[22], and supported empirically by Kleven et al. (2019) [23], such breaks hinder skill accumulation and reduce lifetime earnings, contributing to the persistent gender pay gap.

On the other hand, household-level economic trade-offs are also central to female labor supply decisions. Families assess whether returning to work is financially viable, comparing the mother's post-leave earnings to the cost of childcare. When leave is inadequately paid or short, and childcare expenses are high, re-entering the workforce may appear unprofitable, especially for low- and middle-income households. As Heckman and Killingsworth (1986) observed, labor force participation responds sensitively to net income differentials and the structure of employment-related costs[24].

These mechanisms—related to both individual incentives and household-level economic rationality—highlight the importance of well-calibrated leave policies that preserve job attachment, reduce financial burdens, and encourage equal caregiving. Viewed this way, parental leave is not merely a family support measure but a strategic lever for gender equality, shaping both short-term labor supply and long-term career trajectories.

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[22] Mincer, J. (1974) *Schooling, Experience, and Earnings*.

[23] Kleven, H., Landais, C., & Søgaard, J. E. (2019)*Children and Gender Inequality: Evidence*

[24] Heckman, J.J., & Killingsworth, M.R. (1986). *Female labor supply: A survey*. In O. Ashenfelter & R. Layard (Eds.), *Handbook of Labor Economics*, Vol. 1.

In conclusion, parental leave policies influence female labor force participation through a range of interrelated channels, spanning both supply and demand dynamics. These mechanisms include work–family reconciliation, human capital investment, household economic incentives, and employer responses. However, their effectiveness is not uniform across settings: their impact is shaped—and often significantly moderated—by broader institutional configurations and cultural norms. These mediating factors will be the focus of the next section.

2.3 Role of Cultural Norms and Institutional Contexts

While numerous countries have introduced measures to improve work-family balance, their effectiveness is heavily influenced by the broader institutional and cultural environment in which they are embedded. Merely formalizing the right to parental leave does not automatically translate into real progress toward gender equality in the labor market. As noted in the *Women, Business and the Law* report (World Bank, 2024), a structural gap persists in many countries between de jure provisions and de facto implementation.[25]

A key obstacle to effective implementation lies in persistent cultural expectations that assign primary caregiving roles to women. This issue is central to the expanding literature on the "child penalty"—the long-term economic disadvantage that women experience after becoming mothers. Groundbreaking research by Kleven et al. (2019) and Kleven, Landais, and Søgaard (2024) shows that, in high-income countries, nearly the entire residual gender earnings gap can be attributed to the impact of children. After the birth of their first child, women experience substantial and lasting declines in both earnings and employment, while

[25] World Bank. (2024). *Women, Business and the Law 2024*. Washington, DC: World Bank. https://wbl.worldbank.org/

men's labor market outcomes remain largely unchanged.[26] This penalty operates through three main channels:

- reduced participation in the labor force,
- shorter working hours,
- and a shift to "family-friendly" jobs with lower pay and limited career advancement (Goldin, 2014).[27]

Gender norms, often internalized during early socialization, play a central role in shaping these outcomes. Evidence from Kleven, Olivero, and Patacchini (2024) suggests that girls who are exposed to working mothers during adolescence tend to face a significantly smaller child penalty in adulthood. This points to an intergenerational transmission of social norms.[28]

Institutional factors can either reinforce or weaken these dynamics. In many contexts, the lack of targeted incentives for fathers, combined with weak legal protections and administrative limitations, leads to unequal parental leave uptake. As a result, caregiving continues to fall primarily on women, reinforcing traditional gender roles (World Bank, 2024; Gornick & Meyers, 2003)[29]. Empirical findings from Andresen and Nix (2024) show that, even where paternity leave is available, it often fails to reduce the child penalty. Men

[26] Kleven, H., Landais, C., & Søgaard, J. E. (2024). The child penalty atlas. *Quarterly Journal of Economics, 139*(1), 1–53. https://doi.org/10.1093/qje/qjad032

[27] Goldin, C. (1995). The U-shaped female labor force function in economic development and economic history. In T. P. Schultz (Ed.), *Investment in Women's Human Capital and Economic Development* (pp. 61–90). University of Chicago Press.

[28] Kleven, H., Olivero, M. P., & Patacchini, E. (2024). Social norms and the child penalty. *Econometrica, 92*(2), 377–416. https://doi.org/10.3982/ecta19351

[29] World Bank. (2024). *Women, Business and the Law 2024*. Washington, DC: World Bank. https://wbl.worldbank.org/, Gornick, J. C., & Meyers, M. K. (2003). *Families That Work: Policies for Reconciling Parenthood and Employment*. Russell Sage Foundation.

tend to use leave strategically—taking short breaks or aligning them with holidays—thus avoiding career disruptions without taking on equal caregiving responsibilities.[30]

By contrast, some institutional arrangements—such as those adopted in Norway—have shown potential to reshape social norms. As shown in earlier sections, well-designed parental leave policies, particularly those with non-transferable entitlements, can reduce maternal penalties and promote greater paternal involvement. These examples suggest that well-designed policies can not only mitigate gender inequalities but also serve as catalysts for cultural transformation.

Cross-national differences in the size of the child penalty further highlight the importance of context. According to the *Child Penalty Atlas* (Kleven et al., 2024), while the labor market impact of parenthood is a global phenomenon, its magnitude varies widely. Scandinavian countries report relatively low penalties (3–9%), whereas parts of South Asia see penalties exceeding 60%. These discrepancies cannot be explained by income alone; they reflect underlying differences in gender norms and institutional support.[31]

Data from ILOSTAT (2022) highlight that in many countries, women aged 25–54 with young children participate in the labor force at rates over 40 percentage points lower than men of the same age.[32] Yet the size of this gap varies depending on economic structure and caregiving arrangements context. In lower-income countries, where agricultural work is common and caregiving is often shared within extended families, the penalty tends to be less severe. In contrast, in middle- and high-income countries—where employment is more formalized and families more nuclear—the penalty is significantly larger.

[30] Andresen, Martin Eckho, and Emily Nix. *You Can't Force Me Into Caregiving: Paternity Leave and the Child Penalty*. Working Paper, 2024.

[31] Kleven, H., Landais, C., & Søgaard, J. E. (2024). The child penalty atlas. *Quarterly Journal of Economics, 139*(1), 1–53. https://doi.org/10.1093/qje/qjad032

[32] International Labour Organization (ILOSTAT). (2022). *Spotlight on Work Statistics No. 12: Gender Gaps in Labour Markets*. https://www.ilo.org/ilostat

This aligns with Goldin's (1995) U-shaped hypothesis, which suggests female labor participation initially falls during industrialization but rises as economies develop and family-supportive policies improve[33].

Thus, the impact of family policies depends on both legal design and a country's economic and institutional context.

These theoretical insights lay the foundation for the empirical strategy of this thesis. The analysis investigates whether—and under what conditions—the legal structure (*de jure*) of parental leave policies affects women's labor market participation. Specifically, it tests for heterogeneous effects along two key contextual dimensions:

(1) prevailing social norms, measured through the Gender Social Norms Index (GSNI), which captures the extent of biased attitudes toward women's rights and capabilities across political, economic, and educational domains;
(2) economic development, operationalized via log GDP per capita

2.4 Research hypotheses

Based on the theoretical mechanisms outlined in Section 2, the empirical analysis tests the following hypotheses:

H1. *Paternity leave has a stronger and more robust positive effect on female labor force participation than maternity leave.*

This hypothesis builds on the idea that paternity leave can benefit women's employment by:

- reducing statistical discrimination in hiring decisions (Section 2.2.1),
- redistributing caregiving responsibilities within the household (Section 2.2.3),

[33] Goldin, C. (1995). *The U-Shaped Female Labor Force Function in Economic Development and Economic History*. In T. P. Schultz (Ed.), Investment in Women's Human Capital and Economic Development (pp. 61–90). University of Chicago Press.

- and mitigating long-term penalties associated with motherhood (Sections 2.2.4 and 2.3).

H2. *The effectiveness of parental leave policies is moderated by gender norms: their positive impact on FLFP is stronger in countries with lower levels of gender bias (as measured by GSNI).*

This hypothesis stems from the idea that policy effectiveness depends on social acceptance and cultural uptake. In egalitarian societies, caregiving is more likely to be shared between parents, and paternity leave is more frequently used, amplifying its positive effects on FLFP. Conversely, in countries with strong gender biases, even generous leave entitlements may be underutilized or reinforce traditional divisions of labor.

H3. *The labor market impact of parental leave policies varies non-linearly with economic development, showing heterogeneous effects across income levels*

At lower levels of income, female labor supply is often driven by necessity and informal labor markets and shared caregiving reduce the reach of formal leave policies. Middle-income countries may face enforcement challenges, while high-income countries have stronger institutions but risk that long leave durations weaken women's labor market attachment. This suggests a complex, non-linear relationship shaped by economic and social factors.

These hypotheses are tested using a newly constructed panel dataset covering 178 countries from 1990 to 2023. The empirical strategy combines country- and year-fixed effects models with staggered Difference-in-Differences (DiD) techniques to identify both average treatment effects and context-specific heterogeneity across normative and developmental dimensions.

Table 2.1 – Theoretical Mechanisms Linking Parental Leave Policies to FLFP

Mechanism	Effect on FLFP (Supply/Demand)	Moderators	Authors
Statistical discrimination	Negative (Demand)	Leave taken mainly by women, lack of neutrality	Albanesi and Olivetti
Wage rigidities	Negative (Demand)	Min. wages, fixed pay scales	Olivetti and Petrongolo
Monopsony power	Positive (Demand)	Imperfect competition, low wage elasticity	Manning
Paternity leave and care sharing	Positive (Supply)	Gender norms, father quotas, male uptake	Olivetti and Petrongolo; Nordic Council
Employment continuity	Positive/Negative (Supply)	Leave duration, reintegration pathways	Mincer; Kleven and al.
Incentives and household choices	Positive if well-designed (Supply)	Compensation, childcare, dual-earner model	Heckman; Del Boca and al.
Gender norms	Conditional (Contextual)	GSNI, social beliefs on motherhood/work	Kleven; Davis and Greenstein

3 Data and Empirical Strategy

Chapter 3 presents the data and empirical strategy used to test the hypotheses outlined in Chapter 2. It introduces the panel dataset, describes key variables and descriptive trends, and presents the identification framework adopted to estimate the causal impact of parental leave policies on female labor force participation**.**

3.1 Dataset description: panel of 178 countries (1990–2023)

The empirical analysis relies on a panel dataset of 178 countries from 1990 to 2023, built around the Women, Business and the Law (WBL) 2024 Historical Panel[34], a legal database developed by the World Bank, which systematically codifies national laws regulating economic rights and family-related provisions across more than 190 countries.

The focus is on the Parenthood domain, which provides annually coded legal data on paid maternity, paternity, and shared parental leave.

The period is restricted to 1990–2023 to ensure alignment with labor market indicators, particularly female labor force participation (FLFP), sourced from the World Bank and ILO[35]. The dataset also includes the exact year of legal enactment or reform, enabling the use of staggered Difference-in-Differences (DiD) approaches that exploit temporal and cross-country variation in policy adoption.

Countries with substantial data gaps were excluded to ensure consistency across years. Remaining missing values are isolated and minimal (e.g., Ukraine 2022–2023; Sudan 2023; Palestine 2023) and do not compromise the overall consistency of the dataset.

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[34] World Bank. (2024). *Women, Business and the Law 2024 – Historical Panel Dataset*. Retrieved from https://wbl.worldbank.org/en/wbl-data

[35] World Bank. (n.d.). *World Development Indicators (WDI)*. Retrieved June 2025, from https://data.worldbank.org

In addition to the leave variables, the dataset includes two main control variables: log GDP per capita and fertility rate, both drawn from harmonized international sources. The dependent variable is female labor force participation (FLFP), measured as the share of women aged 15 and older who are economically active. The data are structured for fixed-effects models, supporting both average and heterogeneous treatment effect estimation.

In the second part of the analysis—focused on contextual heterogeneity—the dataset is expanded to incorporate two additional dimensions: gender norms (using the GSNI index) and economic development level (measured using GDP per capita)**.** These moderators, described in detail in Section 3.2.4, are introduced to explore whether and how the effectiveness of family policies varies depending on institutional and cultural context.

The dataset structure reflects the analytical goals of this study and was built around one central question: *Do parental leave policies meaningfully influence women's labor market participation—and if so, through which mechanisms, and under what institutional and cultural conditions?*

3.2 Main variables and indicators

The variables used in the analysis are classified into four categories:
(1) the dependent variable,
(2) policy indicators,
(3) control variables, and
(4) contextual moderators.

3.2.1 Dependent variable

The key outcome of interest is the female labor force participation rate (FLFP), defined as the share of women aged 15 and older who are economically active—either employed or actively seeking work. Widely used in the literature, FLFP serves as a proxy for women's integration into the labor market and their economic empowerment. It reflects both individual-level constraints (e.g., fertility, caregiving, education) and structural barriers

(e.g., discrimination, labor market rigidity), making it a direct indicator of how family policies influence women's participation in paid work after childbirth.

3.2.2 Policy indicators

The main explanatory variables capture the legal structure (*de jure*) of paid parental leave entitlements, as codified in national legislation. These are measured using three indicators from the WBL 2024 Historical Panel:

- *Maternity leave days*: leave legally reserved for the mother;
- *Paternity leave days*: leave legally reserved for the father;
- *Shared leave days*: leave available to either parent but not reserved.

These statutory durations, expressed in total days, are used in raw form to allow for marginal interpretation across all regression models. While these indicators provide a harmonized legal baseline for international comparison, they reflect only the formal presence of policies (*de jure*) and do not capture their actual implementation or uptake (*de facto*). Nonetheless, they offer a robust proxy for assessing global variation in policy design over time.

For analytical clarity, *maternity*, *paternity*, and *shared* leave are treated as distinct legal entitlements, following the WBL 2024 categorization. Shared days are not added to the reserved entitlements, even though in practice they may be used by either parent. This approach allows the analysis to isolate the specific impact of reserved policy design—especially gender-targeted guarantees—on female labor force participation.

These distinctions are important: reserved days represent binding legal guarantees, directly shaping employer expectations and parental behavior. Shared leave, while formally gender-neutral, is often taken predominantly by mothers—unless paired with strong incentives for fathers. As such, the analysis keeps the three dimensions separate to reflect their different behavioral and institutional implications.

3.2.3 Control variables

Two macro-level controls are included in all models:

- *Log GDP per capita* (PPP, constant international dollars), to account for economic development,

- *Fertility rate*, as a proxy for caregiving demands. Both are sourced from the World Bank and the UN World Population Prospects (2022).[36]

3.2.4 Contextual moderators

To explore how the impact of parental leave policies may vary across institutional and cultural settings, two moderating variables are introduced: one capturing prevailing gender norms, and the other reflecting the country's level of economic development.

Gender Social Norms Index (GSNI):

The GSNI measures attitudinal bias—specifically, the share of individuals who express discriminatory beliefs about women's roles and rights in society. The index is constructed using microdata from the World Values Survey (WVS), covering four dimensions:

• political (e.g., views on women as leaders),

• educational (e.g., preference for male university attendance),

• economic (e.g., male job entitlement), and

• physical integrity (e.g., tolerance of domestic violence or restrictions on reproductive rights).

Each dimension is captured by one or two binary-coded survey questions (see Table 3.1). A respondent is classified as "biased" (value = 1) if they express prejudice on at least one item. The resulting composite indicator—bias = 1—represents the share of respondents in each country who exhibit at least one form of gender bias.

This study uses GSNI data from WVS Wave 7 (2017–2022), treating the index as time-invariant across the 1990–2022 panel. The rationale for this choice is discussed in Section 3. For full coding details and question wording, see UNDP (2023), *GSNI Technical Note*.[37]

[36] World Bank (2024), "GDP per capita, PPP (constant international $)", World Development Indicators, DataBank, available at: https://databank.worldbank.org/source/world-development-indicators/series/NY.GDP.PCAP.PP.KD (accessed [data di download])

[37] United Nations Development Programme. (2023). *Technical note: Gender Social Norms Index (GSNI)*. Human Development Report Office.

This specification allows for a context-sensitive assessment of policy effectiveness, recognizing that the influence of parental leave on female labor market participation is not only institutional but also deeply shaped by prevailing social beliefs about gender roles.

Economic development level:

Economic development is measured using GDP per capita (PPP, constant international dollars), and is included in the analysis as a continuous moderator. Specifically, the natural logarithm of GDP per capita and its squared term are used to test for potential non-linear effects on policy impact, in line with Goldin's (1995) U-shaped hypothesis on female labor force participation.

Table 3.1 – Components of the Gender Social Norms Index (GSNI), *Based on UNDP (2023), World Values Survey data*

Dimension	WVS Questions (Paraphrased)	Bias Definition
Political	(1) Equal rights essential for democracy (score ≤ 7); (2) Men better political leaders	Low support or agreement with bias = 1
Educational	University more important for men	Agree or Strongly Agree
Economic	(1) Men should have more job rights when scarce; (2) Men better business executives	Agree or Strongly Agree
Physical Integrity	(1) Justify wife-beating (any answer ≥ 2); (2) Abortion never justifiable	Justification or "Never justifiable" = 1

3.3 Descriptive statistics and trends

This section presents a descriptive overview of the main variables used in the empirical analysis, focusing on paid parental leave entitlements and female labor force participation (FLFP). The goal is twofold: first, to motivate the research design by illustrating the apparent disconnect between policy expansion and labor market outcomes; and second, to

document the institutional and regional heterogeneity that underpins the study's hypotheses.

Temporal Trends in Parental Leave and Female Labor Supply

Figure 3.1 illustrates a significant expansion in paid parental leave entitlements between 1990 and 2023. In particular, shared parental leave increased from approximately 10 to nearly 75 days on average.

At first glance, this trend may seem surprising: shared parental leave appears to dominate maternity and paternity leave globally. However, this is largely an artifact of data structure and averaging methodology, rather than a reflection of widespread policy uptake.

This sharp growth is not representative of most countries, but rather reflects a small number of cases—mainly in Europe and Central Asia—that provide very long non-reserved entitlements.

Indeed, the median number of shared leave days remains zero, indicating that more than half of countries offer no such entitlement at all. The global average is disproportionately raised by a few countries with extremely generous provisions—some exceeding 900 days—which strongly skews the distribution.

This helps explain the apparent dominance of shared leave over maternity and paternity leave in the global average. In many high-income countries, especially in Eastern Europe, shared leave legally replaces or complements maternity leave and is used predominantly by mothers, despite being formally accessible to both parents. In practice, these non-reserved entitlements function as extended maternity leave, and their inclusion as a separate category in the data structure—rather than being combined with mother- or father-specific leave—results in higher average values.

Moreover, because Figure 3.1 is based on unweighted country-level averages, all countries contribute equally regardless of population size. This means that a few small or medium-

sized countries with extremely generous legal provisions can disproportionately raise the global mean.

To address this, Figure 3.3 presents population-weighted averages, which offer a more realistic picture of the typical individual's access to paid leave across the world. In this version, the dominance of shared leave is still visible, but much less pronounced.

Moreover, shared leave is excluded from the staggered DiD models, as discussed in Chapter 3, due to its skewed distribution.

Paternity leave rose from near zero to about 17 days on average, while maternity leave expanded from 2 to 17 days. These increases, particularly after the early 2000s, signal growing legal recognition of work–family reconciliation and generate the necessary temporal variation for empirical identification.

Yet, as Figure 3.2 shows, the expansion in *de jure* rights has not translated into proportional labor market gains: global female labor force participation (FLFP) increased by just three percentage points, from 48.1% in 1990 to slightly above 51% in 2023. This disconnect between formal rights and behavioral outcomes underscores a central puzzle of this study—why legal reforms alone have limited measurable impact on women's labor supply.

This divergence offers preliminary support for Hypotheses 2 and 3, which emphasize the moderating role of gender norms and economic development in shaping policy effectiveness. These trends reinforce the broader aim of this research: to assess not only whether family leave policies work, but under what institutional and cultural conditions they become truly effective.

Figure 3.1 Temporal Trends in Paid Leave Entitlements (1990–2023)
Average number of paid leave days for mothers (maternity leave), fathers (paternity leave), and shared parental leave, computed as simple (unweighted) averages across countries.
Note: Maternity and paternity leave refer to statutory days *exclusively reserved* for the mother and father, respectively. Shared leave includes non-reserved days available to either parent. These figures reflect *de jure legal entitlements*, not actual usage or take-up.
Source: Author's calculations based on WBL 2024 data.

Figure 3.2 – Global Trends in Female Labor Force Participation (1990–2023)
Global average of female labor force participation rate (% of women aged 15 and older), measured annually.
Source: Author's calculations based on World Bank/ILO data**.**

Figure 3.3 – Temporal Trends in Paid Leave Entitlements (Population-Weighted, 1990–2023)

Same indicators as Figure 3.1, but computed as population-weighted averages, where each country's contribution is proportional to its annual population. This provides a more realistic view of individual-level access to leave entitlements globally.
Note: As with Figure 3.1, these are legal entitlements (*de jure*), not behavioral data (*de facto* uptake). Shared leave may still be disproportionately used by mothers in the absence of targeted incentives.
Source: Author's calculations based on WBL 2024 and World Bank population data.

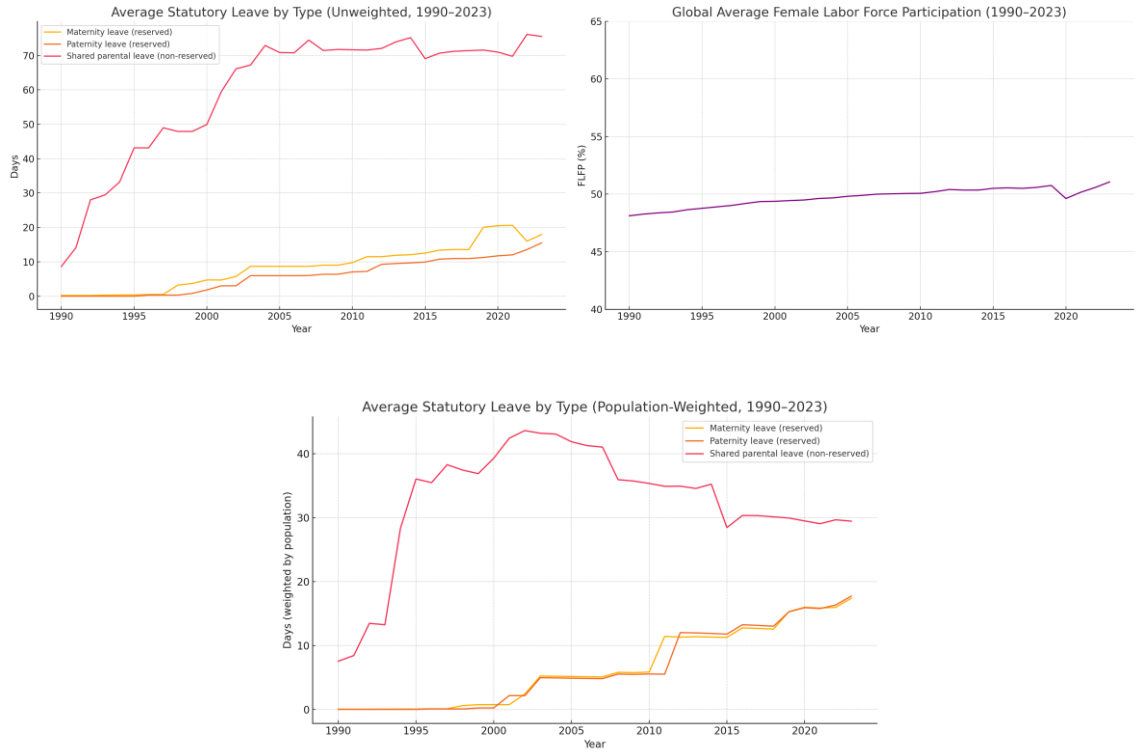


Table 3.2 and Figure 3.4 reveal striking cross-regional disparities in both the design and availability of paid parental leave. High-income OECD countries offer the most comprehensive legal packages, with averages exceeding 40 days each of maternity and paternity leave, and nearly 80 days of shared leave. In contrast, most countries in MENA, South Asia, and Sub-Saharan Africa provide no paid leave for fathers, no shared entitlements, and often only minimal maternity protection.

Europe and Central Asia stands out for its exceptionally high population-weighted average of shared leave (over 330 days). This outlier pattern is largely driven by a few countries with very long, non-reserved entitlements—such as Russia, which offers 475 days of shared parental leave without reserving any days for either parent[38]. Despite their formal neutrality, such provisions are overwhelmingly used by mothers and function in practice as extended maternity leave.

Figure 3.4, a global heatmap of shared parental leave entitlements, visually highlights this imbalance. It clearly shows the concentration of very generous shared leave policies in a small number of countries, especially in Eastern Europe and Central Asia, while the majority of the world offers little or no such entitlement.

Importantly, legal generosity does not always correlate with higher female labor force participation. Europe and Central Asia, despite offering over 250 days of shared leave, reports an FLFP rate (48.2%) comparable to Latin America (49.6%), where leave entitlements are minimal. This disconnect highlights the importance of normative and institutional context—consistent with Hypotheses 2 and 3.

Conversely, East Asia & Pacific and Sub-Saharan Africa show some of the highest FLFP rates (62% and 66%, respectively), despite offering little or no formal leave. In these cases, participation may be driven more by economic necessity, informal employment, or extended family care structures than by formal policy support.

Taken together, these descriptive patterns underscore a central finding: the legal expansion of parental leave entitlements has not yielded uniform gains in women's labor force participation. This calls for a causal framework that accounts for both policy content and the societal conditions under which it is enacted.

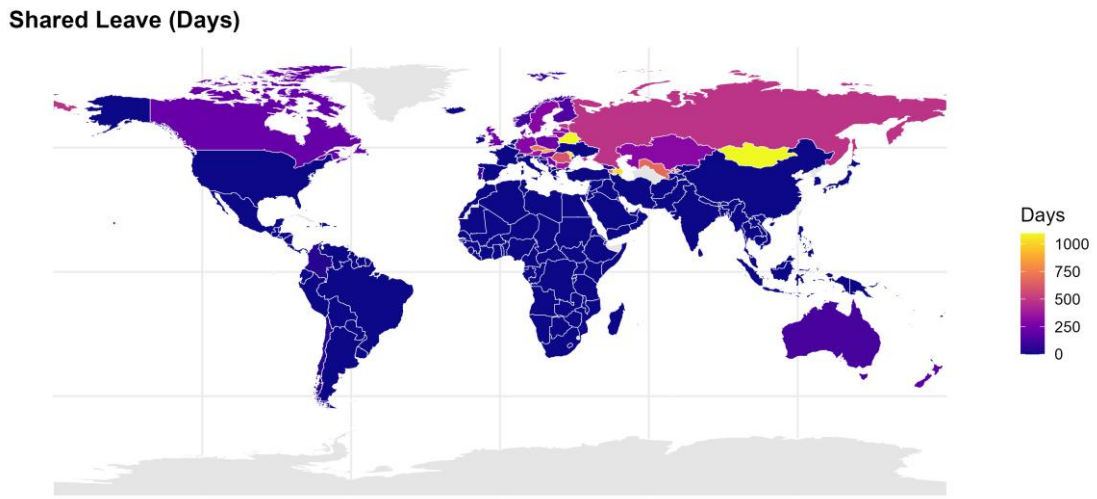
[38] According to Article 256 of the Russian Labor Code, either parent may take parental leave until the child reaches 18 months, but in practice, it is almost exclusively used by mothers. See: *Labor Code of the Russian Federation (No. 197-FZ, December 30, 2001), Article 256.*

Table 3.2 – Population-Weighted Regional Averages of Parental Leave and FLFP (1990–2023)

This table reports population-weighted averages of paid maternity, paternity, and shared parental leave entitlements across world regions, along with average female labor force participation (FLFP). Leave days reflect statutory entitlements as codified in national legislation (de jure), not actual uptake (de facto). Shared leave refers to non-reserved days available to either parent. Values are weighted by annual national population to reflect global individual-level access.

Region	Avg. Days for Mother	SD – Mother Days	Avg. Days for Father	SD – Father Days	Avg. Shared Days	SD – Shared Days	Avg. FLFP (%)	SD – FLFP
East Asia & Pacific	0.32	13.66	0.15	1.02	0.13	11.36	62.34	7.69
Europe & Central Asia	8.18	58.84	0.93	7.98	339.81	338.55	48.23	11.01
High income: OECD	43.19	94.49	45.53	102.41	78.41	189.78	52.45	6.22
Latin America & Caribbean	0.0	0.0	0.0	0.0	0.24	3.19	49.57	7.09
Middle East & North Africa	0.02	0.53	0.02	0.53	0.0	0.0	18.13	7.63
South Asia	0.0	0.0	0.0	0.0	0.0	0.0	28.86	5.31
Sub-Saharan Africa	0.0	0.0	0.0	0.0	0.0	0.0	65.82	15.11

Figure 3.4 – Cross-National Variation in Shared Leave (1990–2023)
Average number of statutory paid shared leave days by country (1990–2023). Lighter shades indicate longer legal entitlements. The map illustrates the globally uneven distribution of shared leave provisions.
Source: Author's calculations based on WBL 2024 Historical Panel.



To complement the descriptive trends, Table 3.3 presents pairwise correlations between paid leave entitlements and female labor force participation (FLFP). As expected, the associations are modest and non-causal, reflecting the complexity of the relationship between policy and labor outcomes.

Maternity leave is weakly negatively correlated with FLFP (–0.0336), possibly due to extended caregiving reducing labor market attachment—or reverse causality, where low-FLFP countries adopt more generous policies. Shared leave shows a small positive correlation (+0.0826), consistent with more gender-equal policy design. Paternity leave has almost no correlation (+0.0078).

The correlation matrix also shows limited collinearity among policy variables. Only maternity and paternity leave are moderately correlated (+0.63), suggesting co-occurrence in more generous systems. Shared leave is largely independent, underscoring its distinct design logic.

Table 3.3– Correlation between Leave Policies and Female Labor Force Participation

Panel A reports pairwise Pearson correlations between leave policy variables and female labor force participation (FLFP). Panel B shows correlations between the leave policy variables themselves**.**

Section	Variable	Correlation
Panel A: With FLFP	Days for Mother	–0.0336*
	Days for Father	+0.0078
	Shared Days	+0.0826*
Panel B: Between Policy Variables	Mother – Father	+0.6337*
	Mother – Shared	–0.0241
	Father – Shared	–0.0165

Note: Pairwise Pearson correlations.
* p<0.1, ** p<0.05, *** p<0.01.

3.4 Empirical Strategies

This section outlines the empirical strategy employed to estimate the impact of parental leave policies on female labor force participation (FLFP), while addressing the key identification challenges posed by potential endogeneity. Policy reforms often coincide with broader societal shifts—such as rising gender equality or institutional reforms—making it difficult to isolate causal effects. As highlighted by Olivetti and Petrongolo (2017), more egalitarian countries may simultaneously expand leave entitlements and experience increases in FLFP, complicating causal attribution. Moreover, leave policies often co-evolve with other family-related measures (e.g., childcare subsidies, tax incentives), further blurring their isolated effects.

To address these concerns, this thesis adopts a multi-method identification strategy that goes beyond conventional fixed-effects approaches by integrating four complementary components:

- Two-way fixed effects (TWFE) models to estimate average within-country effects over time;
- Event study analysis to assess dynamic impacts and test the parallel trends assumption;

- Staggered Difference-in-Differences (DiD) estimators (Callaway & Sant'Anna, 2021) to handle heterogeneous treatment timing and estimate group-time average treatment effects (ATT_{g,t});
- Interaction models to test for contextual heterogeneity by gender norms and economic development, in line with Hypotheses 2 and 3.

The main contribution of this study is to combine multiple methods in a cross-national panel analysis, while explicitly accounting for how gender norms and economic development influence the impact of leave policies. In doing so, the analysis provides new evidence on the uneven effectiveness of work-family policies depending on a country's normative and economic environment, a dimension often overlooked in the macro-comparative literature.

This empirical strategy also contributes methodologically by applying staggered DiD techniques—still rare in global policy evaluation—to the domain of gender and labor market research. All models include key controls (log GDP per capita and fertility rate), country and year fixed effects, and clustered standard errors at the country level.

Together, these innovations allow for a more credible and nuanced estimation of both average policy impacts and their context-dependent variation, offering a richer understanding of when and where parental leave reforms are most likely to succeed.

3.4.1 Baseline Fixed Effects Model

As a starting point, the analysis employs a two-way fixed effects (TWFE) model to estimate the average association between parental leave entitlements and female labor force participation (FLFP). This approach exploits within-country variation over time, controlling for unobserved heterogeneity via country and year fixed effects. The model includes the full set of policy and control variables introduced earlier.

To address potential overlap among leave types, three specifications are estimated: (1) maternity and paternity leave only, given their moderate correlation and frequent co-occurrence; (2) shared leave only, due to its distinct logic and weak correlation with the others; and (3) a full model including all three. This setup helps isolate the net effect of each component and assess robustness across models.

These choices are guided by the correlation matrix, which shows moderate collinearity between maternity and paternity leave (+0.63), and low correlation between shared leave and the others.

All regressions use ordinary least squares (OLS), with standard errors clustered at the country level. This baseline offers a static benchmark for the dynamic and heterogeneous effects explored in the following sections.

3.4.2 Event Study Design

To complement the baseline fixed effects estimates and examine the dynamic effects of parental leave reforms, the empirical strategy includes an event study design centered on the year of policy introduction. The model traces changes in female labor force participation (FLFP) from five years before to five years after the reform ($t = -5$ to $t = +5$), offering a detailed view of how labor outcomes evolve around the policy shift.

While not causal per se, the event study plays a central role in identification for three reasons. First, it provides a visual and statistical test of the parallel trends assumption: the presence of negative pre-trends would signal potential endogeneity or omitted variable bias, weakening causal claims. Second, it captures the timing and persistence of policy effects, which may unfold gradually—particularly for reforms targeting social norms or caregiving behaviors. Third, it offers descriptive support for the hypothesized effects: if FLFP increases post-reform with no pre-trend, this bolsters the plausibility of a causal relationship.

Technically, the model estimates a series of leads and lags relative to the reform year, excluding $t = -1$ as the reference category. Country and year fixed effects are included to absorb unobserved heterogeneity, and macro-level controls—log GDP per capita and fertility rate—are retained throughout.

3.4.3 Staggered Difference-in-Differences (DiD)

To estimate the causal effect of family leave policies on female labor force participation (FLFP), this section adopts a staggered Difference-in-Differences (DiD) approach,

following the methodology developed by Callaway and Sant'Anna (2021)[39]. Unlike conventional DiD models—which assume all treated units receive the intervention simultaneously (e.g., Heckman et al., 1997; Abadie, 2005; Athey & Imbens, 2006)—this framework accounts for variation in treatment timing across units. Given the gradual diffusion of family leave policies across countries, this feature makes the method particularly suitable for the current panel, covering up to 178 countries annually from 1990 to 2023.

The staggered DiD design offers several methodological advantages. First, it estimates group-time average treatment effects (ATT_{g,t}), avoiding the restrictive assumption of homogeneous effects across time and countries. This addresses a major limitation of standard two-way fixed effects models, which can yield biased estimates in the presence of treatment effect heterogeneity (Goodman-Bacon, 2021; Sun & Abraham, 2020)[40]. Second, it allows for covariate adjustment—here, log GDP per capita and fertility rate—strengthening the credibility of the conditional parallel trends assumption.

Third, it employs a doubly robust estimator, combining outcome regression with inverse probability weighting to reduce bias due to model misspecification. Finally, it enables the estimation of dynamic treatment effects and supports the construction of simultaneous confidence intervals, offering more reliable inference over time.

The analysis focuses on three types of paid leave policies:

- Paternity leave: countries where *DaysForTheFather* > 0;
- Maternity leave: countries where *DaysForTheMother* > 0;

[39] Callaway, B., & Sant'Anna, P. H. C. (2024). *Introduction to DiD with Multiple Time Periods*.

Callaway, B., & Sant'Anna, P. H. C. (2021). *Difference-in-Differences with Multiple Time Periods*. *Journal of Econometrics*, 225(2), 200–230. https://doi.org/10.1016/j.jeconom.2020.12.001

[40] Sun, L., & Abraham, S. (2020). Estimating dynamic treatment effects in event studies with heterogeneous treatment effects. *Journal of Econometrics, 225*(2), 175–199. https://doi.org/10.1016/j.jeconom.2020.09.006

- Shared parental leave: countries where *SharedDays* > 0.

For each policy, countries are grouped based on the first year of adoption (*G_i*). Due to the staggered nature of treatment, countries that have not yet introduced a given policy serve as controls for those that have. This "not-yet-treated" design enhances identification and circumvents the limitations posed by the small number of never-treated units.

Formally, the model is expressed as:

Equation (3.1) $FLFP_{it} = \alpha_i + \delta_t + \sum_{g,t} ATT\{g,t\} * 1(G_i = g, T = t) + X_{it} * \beta + \varepsilon_{it}$

with α_i and δ_t denoting country and year fixed effects, and X_{it} the control variables. [41]

The empirical design is applied selectively:

For maternity and paternity leave, the required conditions for staggered DiD are met : there is sufficient variation in treatment timing (25–27 treated countries), with adequate pre- and post-treatment periods for dynamic analysis.

In contrast, shared parental leave lacks the variation needed. Early adopters are clustered in 1990 (7 countries), while some reforms occur as late as 2022 (3 countries), leaving little room for dynamic estimation. Between 1993 and 2017, most treatment years involve only one or two countries, limiting statistical power. Moreover, diagnostic tests reveal significant pre-treatment differences in FLFP trends, violating the parallel trends assumption. These patterns are consistent with the descriptive evidence presented in Section 3.3, which shows that the observed rise in shared leave is largely driven by a small group of countries. For these reasons, the staggered DiD approach is not applied to the shared leave policy.

The validity of this strategy rests on four key assumptions:

[41] $ATT_{g,t} = E[(Y_t - Y_{g-1}) \mid G = g] - E[(Y_t - Y_{g-1}) \mid D_t = 0, G \neq g]$

where G=g denotes the group first treated in period g, and Dt=0 indicates never-treated or not-yet-treated units.

1. Well-defined treatment assignment — each country is assigned to a group based on the first year of adoption.
2. Irreversibility — once adopted, the policy remains in place.
3. No anticipation — treatment effects do not appear before adoption; this is supported by flat pre-trends in most cases.
4. Conditional exogeneity of timing — the most critical and challenging assumption, especially in cross-country analyses.

While the first three assumptions are verified through graphical and statistical diagnostics, the fourth requires more caution. The timing of adoption may be influenced by unobserved factors—such as institutional reform, cultural shifts, or political change—that also affect FLFP. Although adjusting for observable covariates helps reduce bias, residual confounding cannot be fully ruled out. These issues are further discussed in Section 3.5.

3.4.4 Testing for Heterogeneous Treatment Effects

In line with Hypotheses 2 and 3 outlined in Chapter 2, the empirical strategy tests whether the effect of parental leave policies on female labor force participation (FLFP) varies systematically across two key structural dimensions: (1) prevailing gender norms and (2) the level of economic development.

To operationalize this, interaction terms are introduced within a two-way fixed effects (TWFE) framework. These models do not aim to identify causal effects of the moderators themselves, but rather to assess whether the estimated policy impacts differ depending on the normative and economic context—thereby providing a direct test of H2 and H3.

(a) Interaction with Gender Norms

The first empirical model explores whether the effectiveness of parental leave policies is moderated by the Gender Social Norms Index (GSNI), as introduced in Section 3.2.4.

The GSNI, derived from Wave 7 of the World Values Survey (2017–2022), is a time-invariant, country-level measure of gender bias across four domains: political, educational,

economic, and physical integrity. Since the index is available for only 38 countries, the analysis was conducted on this subset. While this reduces the overall number of observations, the sample retains adequate global representativeness, covering countries from Europe, Latin America, Sub-Saharan Africa, Asia, and the Middle East, with varying levels of economic development and gender bias.

As a proxy for deep-rooted cultural attitudes, the GSNI is treated as a stable contextual factor. While it does not vary over time within countries, its cross-national differences offer a useful lens to assess how normative environments influence the impact of family leave policies. The limitations of this approach are discussed further in Section 3.5.

To capture possible non-linear dynamics, the model includes both linear and squared interaction terms between GSNI and each type of leave policy. The empirical specification is as follows: Equation (3.2) $FLFP\_it = \alpha_i + \delta_t +$

$$+ \beta_1 \cdot DaysMother\_it \cdot GSNI\_i + \beta_2 \cdot DaysMother\_it \cdot GSNI\_i^2$$

$$+ \beta_3 \cdot DaysFather\_it \cdot GSNI\_i + \beta_4 \cdot DaysFather\_it \cdot GSNI\_i^2$$

$$+ \beta_5 \cdot SharedDays\_it \cdot GSNI\_i + \beta_6 \cdot SharedDays\_it \cdot GSNI\_i^2$$

$$+ \gamma \cdot X_{it} + \varepsilon_{it}$$

All variables are defined as in previous models. Interactions are entered separately for maternity, paternity, and shared leave. Standard errors are clustered at the country level. Since GSNI is time-invariant, it is fully absorbed by the country fixed effects and thus does not appear as a standalone regressor. However, its interactions with time-varying policy variables remain identified and interpretable. This allows the model to test whether entrenched normative contexts influence the translation of policy inputs into labor market outcomes, rather than estimating the direct effect of norms themselves. This aligns with the broader theoretical framework in Chapter 2, which views policy responsiveness as shaped by both institutional design and cultural acceptance.

(b) Heterogeneity by Economic Development (log GDP per capita)
To empirically test Hypothesis 3 a two-way fixed effects model is estimated with

interaction terms between parental leave policies and both the log of GDP per capita and its square. This specification allows for nonlinear heterogeneity in the effectiveness of leave policies across different stages of development.

The baseline specification is: Equation (3.3) $FLFP\_it = \alpha_i + \delta_t +$

$$\beta_1 \cdot DaysMother\_it \cdot log(GDP\_it) + \beta_2 \cdot DaysMother\_it \cdot log(GDP\_it)^2 +$$

$$\beta_3 \cdot DaysFather\_it \cdot log(GDP\_it) + \beta_4 \cdot DaysFather\_it \cdot log(GDP\_it)^2 +$$

$$\beta_5 \cdot SharedDays\_it \cdot log(GDP\_it) + \beta_6 \cdot SharedDays\_it \cdot log(GDP\_it)^2 +$$

$$\gamma \cdot X_{it} + \varepsilon_{it}$$

All variables are defined as in previous models. Interactions are included separately for maternity, paternity, and shared leave. Standard errors are clustered at the country level.

The inclusion of both linear and quadratic interaction terms between each policy and GDP per capita allows the marginal effect of an additional day of leave to vary non-monotonically with economic development. Take paternity leave as an example:

$$\partial FLFP\_it \,/\, \partial DaysFather\_it = \beta_3 \cdot log(GDP\_it) + \beta_4 \cdot log(GDP\_it)^2$$

This functional form captures potential U-shaped or inverse U-shaped effects, depending on the signs and magnitudes of the coefficients. The model thus enables an empirical test of whether the effectiveness of leave policies changes at different stages of development—consistent with theories suggesting that labor market responses to gender-related policies evolve over the development path.

In both approaches, average marginal effects were computed to aid interpretation of the interaction terms. To strengthen the findings related to Hypothesis 2—on the moderating role of gender norms—a counterfactual scenario was simulated in which all countries were assigned Sweden's GSNI level. Sweden was chosen as a benchmark because it consistently ranks among the countries with the lowest levels of attitudinal gender bias, reflecting a strong societal commitment to gender equality. As discussed in Chapter 2, Sweden has also been a pioneer in the design of egalitarian family policies—such as non-transferable

paternity leave—which have shown measurable effects on both caregiving behavior and labor market outcomes. This counterfactual illustrates more clearly how structural gender norms condition the effectiveness of parental leave policies, holding all else constant.

These interaction models complement the staggered DiD estimates by showing how institutional and cultural variation—already emphasized in the theoretical chapters—conditions the impact of legally enacted reforms. Full results and visualizations are presented in Section 4.

3.5 Challenges and limitations

While this study adopts a rigorous and multi-method empirical strategy to assess the impact of parental leave policies on female labor force participation (FLFP), several limitations must be acknowledged to appropriately contextualize the findings and guide their interpretation.

First, the analysis is conducted at the macro level, using country-level panel data spanning more than three decades. The dependent variable—FLFP—captures the labor market activity of all women aged 15 and older, rather than isolating the behavioral responses of new mothers, who are the direct targets of parental leave reforms. As such, observed effects may be attenuated, especially in the short term. Moreover, FLFP does not account for job quality, wage dynamics, or unpaid labor—dimensions especially relevant in low- and middle-income countries. These constraints suggest the results should be read as medium- to long-term associations rather than immediate behavioral effects.

Second, the key explanatory variables—maternity, paternity, and shared leave—reflect legal entitlements (de jure), not actual uptake or enforcement (de facto). They omit critical policy features such as generosity, replacement rates, and job protection. Nevertheless, these indicators represent the only harmonized global source for legal leave entitlements and remain a necessary precondition for any policy impact. Prior research also suggests that legal norms can influence expectations and behaviors even in the absence of full uptake. As such, the results should be interpreted as the impact of legal design features—not of policy implementation or parental behavior. The analysis estimates whether the

existence and structure of reserved or shared entitlements is statistically associated with changes in aggregate female labor force participation, conditional on broader institutional and cultural factors.

Third, while staggered Difference-in-Differences (DiD) models help address concerns around endogeneity and heterogeneous treatment timing, residual confounding may persist. The timing of adoption may be influenced by unobserved factors—such as institutional reform or cultural shifts—that also affect FLFP. This represents a key challenge to causal inference, despite the safeguards embedded in the empirical strategy.

The analysis of contextual heterogeneity introduces further limitations. The GSNI, used as a moderator, is treated as time-invariant due to data availability (2017–2022), limiting its ability to capture within-country normative shifts over time. In addition, interaction models using the GSNI are run on a subset of 38 countries, which—while regionally diverse—may limit statistical power and generalizability.

Despite these constraints, the study adopts multiple strategies to enhance robustness. These include placebo tests using male labor force participation (ages 15–24) as a falsification outcome—based on the premise that this group should not be directly affected by parental leave reforms. The absence of significant effects in these placebo models helps rule out spurious correlations. Additional safeguards include event-study diagnostics to test pre-treatment trends, the use of time-varying controls (GDP per capita and fertility), and interaction models capturing structural moderators.

These limitations, while important, do not undermine the analytical contribution of the study. Rather, they offer essential context for interpreting the findings in Chapter 4—as conditional associations shaped by institutional frameworks, cultural norms, and economic structures.

4 Empirical Results

4.1 Baseline Fixed Effects Estimates

Table 4.1 reports the results from three fixed-effects model specifications: (1) including only maternity and paternity leave; (2) including only shared parental leave; and (3) a full model with all three types of leave.

In line with Hypothesis 1, paternity leave emerges as a statistically significant and theoretically consistent predictor of female labor force participation (FLFP). In both models where it is included, each additional day of paid paternity leave is associated with a 0.0135–0.0136 percentage point increase in FLFP ($p < 0.05$). While the effect size is modest—translating to an increase of about 0.8 percentage points for a 60-day entitlement—it aligns with expectations for macro-level analyses, where much of the variance is absorbed by country and year fixed effects.

This limited magnitude does not imply policy ineffectiveness but rather reflects the averaging of diverse national contexts and policy designs. Crucially, the direction and significance of the coefficient support the theoretical mechanism that greater paternal involvement can ease the care burden on mothers and facilitate their sustained labor market participation.

By contrast, maternity leave days show no significant association with FLFP. Coefficients are small, imprecisely estimated, and statistically insignificant across all specifications. This finding echoes earlier literature suggesting that maternity-focused policies—when not paired with reintegration measures or balanced caregiving incentives—may have limited effects on women's employment trajectories.

Surprisingly, shared parental leave displays a negative but non-significant coefficient. This may stem from low uptake, uneven household use, or weak enforcement, especially in countries lacking dedicated quotas or incentives for fathers. As later sections will show, these institutional limitations likely explain the muted average effect of shared leave policies.

Among the control variables, log GDP per capita is positively and significantly associated with FLFP, consistent with the idea that economic development expands employment opportunities and institutional support for working women. Fertility rates are negatively signed but not statistically significant, suggesting a weaker role once other factors are controlled for.

Overall, these baseline estimates provide an initial indication that paternity leave may play a meaningful role in supporting women's labor market participation. However, as discussed in Chapter 3, fixed-effects models alone cannot establish causality. The next sections apply more robust identification strategies—including event study and staggered Difference-in-Differences approaches—to assess the dynamic and context-dependent impact of family leave policies.

Table 4.1 – Fixed Effects Estimates of Parental Leave on Female Labor Force Participation

Model specifications include: (1) maternity and paternity leave only; (2) shared parental leave only; and (3) all policy variables simultaneously. The dependent variable is the female labor force participation rate (FLFP). All models include country and year fixed effects. Standard errors are clustered at the country level.

VARIABLES	(1) Mother + Father Only	(2) Shared Only	(3) All Policies Combined
Days for Mother	0.0004 (0.001)		0.0003 (0.001)
Days for Father	0.0136** (0.005)		0.0135** (0.005)
Shared Days		−0.0013 (0.002)	−0.0012 (0.002)
log GDP	0.7735* (0.402)	0.9097** (0.390)	0.8263** (0.389)
Fertility Rate	−0.0894 (0.501)	−0.0292 (0.496)	−0.0678 (0.496)
Observations	5,787	5,787	5,787
R-squared	0.028	0.021	0.029
Number of country_id	178	178	178

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

4.2 Dynamic Effects (Event Study)

Figure 4.1 presents event study estimates tracing the evolution of female labor force participation (FLFP) from five years before to five years after the introduction of different types of parental leave policies. Each panel focuses on one policy: paternity leave (top left),

maternity leave (top right), and shared parental leave (bottom). Coefficients reflect the estimated change in FLFP relative to the year immediately preceding the reform (**t = –1**), which is excluded from the regression and serves as the reference category. Vertical bars represent 95% confidence intervals.

The panel on paternity leave shows no discernible pre-treatment trend: the coefficients before the reform fluctuate around zero and are statistically insignificant. After policy adoption, the estimates remain flat, with wide confidence intervals and no statistically significant changes in FLFP. These dynamics suggest an absence of both anticipation effects and short-term responses to paternity leave reforms.

The panel on maternity leave shows mildly negative but non-significant coefficients in the pre-reform period (t = –5 to –2), followed by a gradual upward trend beginning after the reform, with a peak between years +3 and +5. However, post-treatment estimates remain statistically insignificant, and confidence intervals are wide, suggesting at most a delayed and weak effect.

The shared parental leave panel reveals a more complex and asymmetric dynamic. The pre-treatment period is marked by a notable decline in FLFP, with several significantly negative coefficients. This raises concerns about reverse causality—specifically, whether declining female participation may have prompted policy reform. After adoption, estimates rise sharply, peaking around years +3 to +5. Given the magnitude of these changes, the y-axis is rescaled. Still, interpretation must be cautious: the estimates rely on a small number of treated countries (N = 8), and confidence intervals remain large.

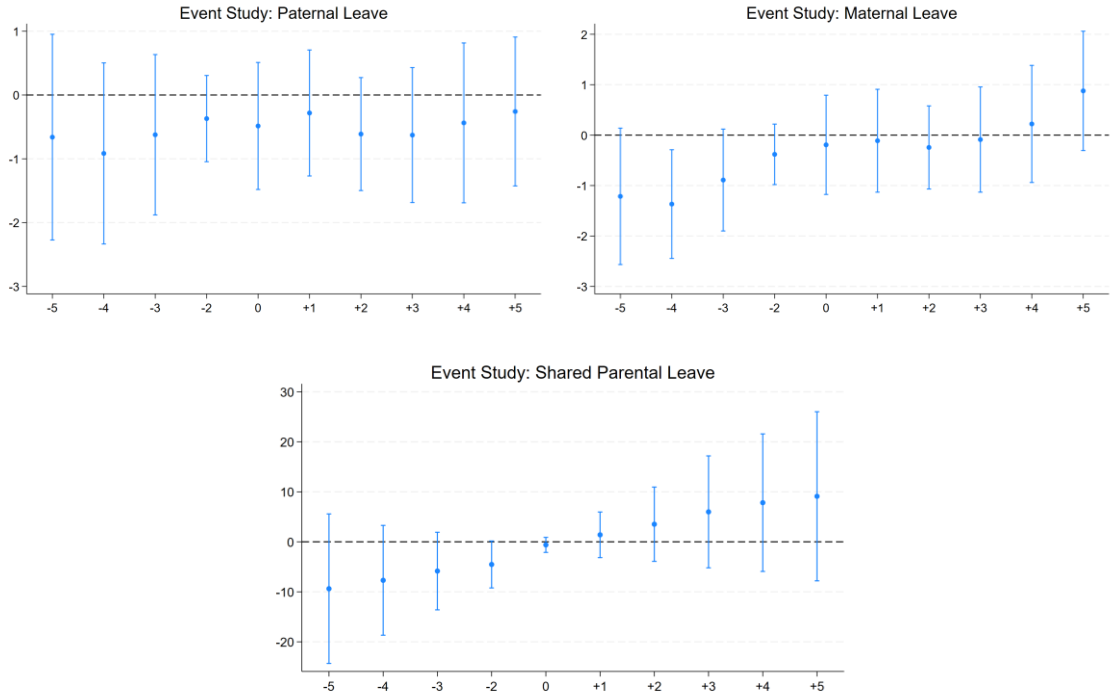
As discussed in Chapter 3.4.3, the timing of shared leave reforms tends to cluster at the start or end of the sample period, limiting the identification of clean pre- and post-treatment effects. For this reason, shared leave is excluded from the staggered Difference-in-Differences analysis.

Overall, these event study plots provide suggestive evidence on the timing and potential direction of policy impacts, rather than definitive causal inference. The contrasting patterns—flat for paternity leave, gradually rising for maternity leave, and sharply reversing for shared leave—highlight the importance of policy design and context. Taken

together, they point to possible medium-term shifts in women's labor supply in response to different types of parental leave reforms.

Figure 4.1 – Event Study Estimates of Parental Leave Policies on FLFP

Dynamic estimates of the effect of paternity leave (top left), maternity leave (top right), and shared parental leave (bottom) on female labor force participation (FLFP). Each dot shows the change in FLFP relative to the year before the reform (t = –1), with 95% confidence intervals. The y-axis in the bottom panel is rescaled due to larger effect sizes. Estimates for shared leave are based on a smaller sample and should be interpreted with caution.



4.3 Staggered DiD Results

The dynamic ATT estimates for paid maternity leave (Days for Mothers) reveal a complex and time-varying trajectory. For early-treated cohorts, such as those treated in 1996, short-term effects are negligible or even negative. Several pre-treatment estimates fall significantly below zero:

- ATT_{1996,1991} = –1.90
- ATT_{1996,1992} = –3.03

These findings raise concerns about the parallel trends assumption and suggest that structural declines in female labor force participation (FLFP) may have preceded the policy intervention.

In contrast, countries treated in 1999 show more favorable post-reform dynamics. Statistically significant positive effects emerge 8–10 years after the policy change:

- ATT_{1999,2008} = +4.29 (CI: [1.45, 7.13])
- ATT_{1999,2009} = +4.43 (CI: [1.34, 7.51])
- ATT_{1999,2010} = +5.29 (CI: [1.49, 9.10])

Overall, FLFP gradually increases after policy adoption, peaking around event year +20 (just over +3 percentage points), before stabilizing and eventually declining. Beyond that point, however, the estimated effects lose statistical strength. The average ATT across all cohorts is +0.95 percentage points (95% CI: [–1.47, +3.38]), yet this estimate does not reach conventional levels of significance. When adjusting for simultaneous confidence bands, no post-treatment dynamics remain robust, and the widening standard errors in later years further weaken inference reliability.

These results suggest that paid maternity leave does not produce strong or immediate gains in women's employment. While moderate improvements emerge in the medium term, they appear temporary and fade over time. This modest pattern may reflect slow-moving responses among employers and households—such as increased formalization of maternal employment, greater job security, and gradual shifts in social norms. However, without complementary policies like accessible childcare or well-designed paternity leave, such gains are unlikely to persist.

This dynamic pattern is visualized in Figure 4.2, where ATT estimates rise steadily until event time +20, then level off and decline. Full estimates and confidence intervals are reported in the Appendix.

Figure 4.2 – Dynamic Treatment Effects of Maternity Leave on Female Labor Force Participation

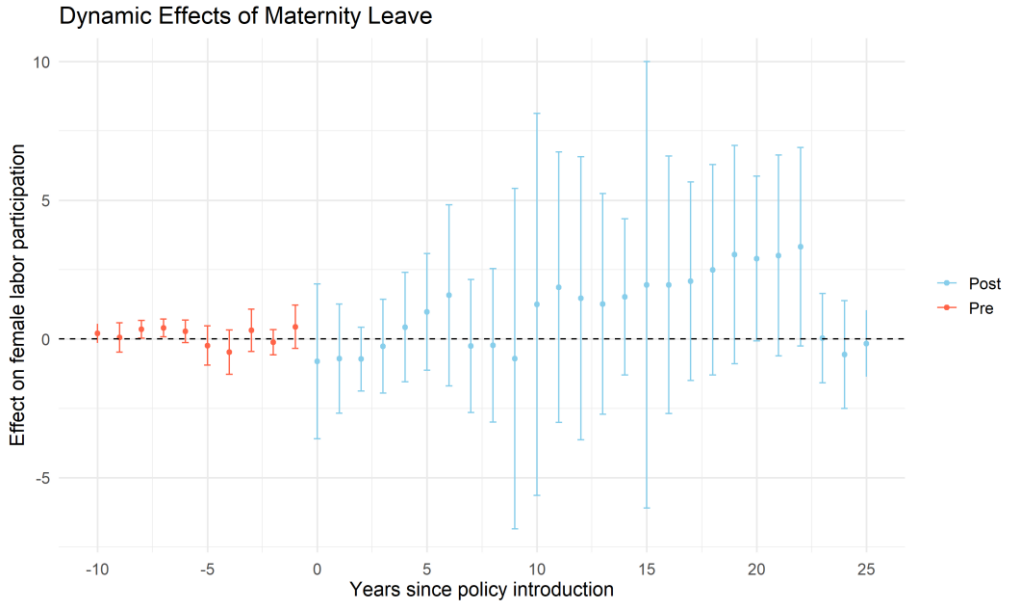
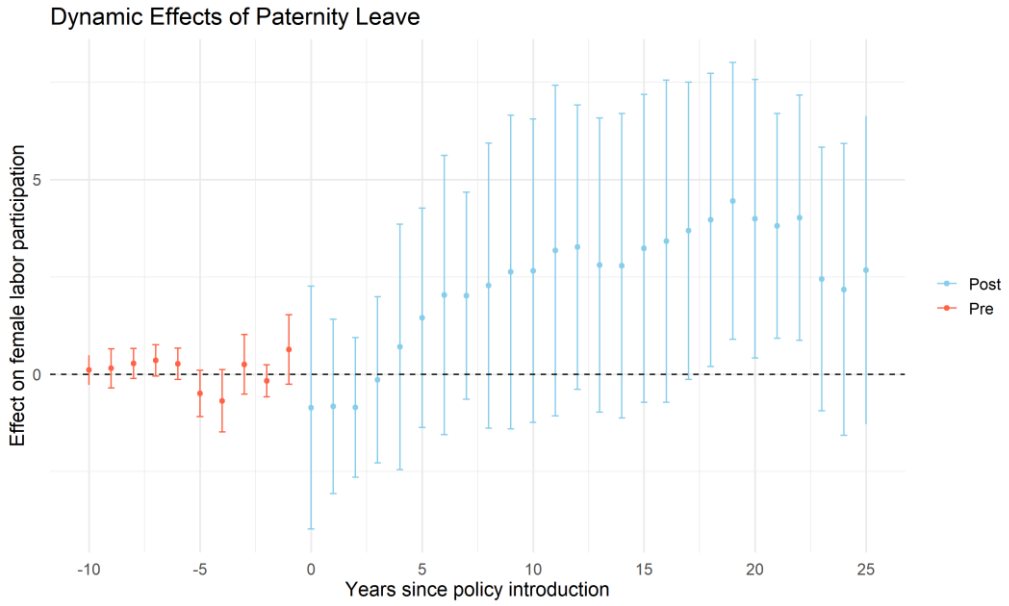


Figure 4.3 presents the dynamic treatment effects of paternity leave on FLFP. Each point shows the average ATT for countries observed at a given event time (i.e., years since policy adoption), aggregated across cohorts with sufficient post-treatment data. Pre-treatment estimates (red dots) are close to zero and statistically insignificant, supporting the parallel trends assumption.

Figure 4.3 – Dynamic Treatment Effects of Paternity Leave on Female Labor Force Participation



Post-reform, no short-term effects are detected. Treatment effects begin to increase gradually around year +7, becoming more pronounced by year +10. From year +18 onward, estimates exceed +3 percentage points and become statistically significant, peaking at around +4 percentage points between years +19 and +21. The overall average ATT is +2.29 percentage points, but masks substantial variation over time, particularly stronger effects in later post-treatment years[42].

[42] The average ATT reflects cohort- and time-specific effects aggregated across units with staggered adoption timing. As such, it captures the mean treatment effect among the treated, conditional on being observed at each event time.

The temporal profile suggests that paternity leave operates more as a long-term catalyst than a short-term intervention. Although the delay may seem counterintuitive—given that affected children are no longer infants when effects emerge—several mechanisms help explain this pattern:

1. Data aggregation: As noted in the limitations section, working with country-level data may obscure early impacts that initially affect only a small subset of the population (e.g., new mothers). Observable effects at the macro level require broader behavioral changes that unfold gradually. Consequently, the estimated effects on female labor force participation (FLFP) should be interpreted as lower-bound estimates of the true policy impact—especially among the directly affected group. Behavioral changes that begin with postpartum women may only become visible in aggregate labor statistics once they scale up across cohorts and time.

2. Cultural and structural inertia**:** As discussed in Chapter 2 and supported by prior research (Olivetti & Petrongolo, 2017; González, 2007), deeply embedded gender norms slow the uptake of new caregiving roles[43]. The most meaningful effects may emerge only when younger cohorts—socialized with more involved fathers—reach working age (Kleven et al., 2024; Olivero et al., 2024)[44].

3. Policy uptake dynamics: As shown by Andresen and Nix (2024), early take-up of paternity leave is often symbolic or strategic[45]. Over time, as paternal caregiving becomes normalized, it can shift household bargaining power and caregiving norms, resulting in more substantial behavioral change.

[43] González, L. (2007). The Effect of a Universal Child Benefit on Conceptions, Abortions, and Early Maternal Labor Supply. *Labour Economics*, 13(6), 805–830. https://doi.org/10.1016/j.labeco.2006.04.001

[44] Kleven, H., Landais, C., & Søgaard, J. E. (2024). *Children and Gender Inequality: Evidence from 20 Years of Danish Administrative Data*. Forthcoming, *American Economic Review*.

[45] Andresen, M. E., & Nix, E. (2024). *Symbolic vs. Substantive Use of Paternity Leave: Evidence from European Countries*. Forthcoming, *Journal of Labor Economics*.

4. Institutional mediation: Policy design matters. Stronger and earlier responses tend to occur in countries with robust features—such as non-transferable quotas for fathers or generous wage replacement. Where implementation is weak or cultural resistance is high, behavioral change unfolds more slowly.

In summary:

- *Maternity leave* yields modest, short-lived effects, peaking around year +20 before declining.
- *Paternity leave* generates stronger and more sustained impacts, emerging 7–10 years after implementation and reaching up to +3 percentage points in later post-treatment periods.

These results support Hypothesis 1: the long-run effects of paternity leave exceed those of maternity leave. This motivates the next section, which explores heterogeneity across institutional and normative contexts.

4.4 When Context Matters: Heterogeneity by Gender Norms and Development

This section examines how the effects of parental leave policies on FLFP vary systematically with cultural (GSNI) and economic (GDP) context. We begin with the role of gender norms, followed by an analysis of heterogeneity by development level.

(a) Interaction with Gender Norms

While previous analyses have assessed the average association between parental leave policies and female labor force participation (FLFP), this section explores whether these effects vary depending on prevailing gender social norms. To capture this normative dimension, the analysis relies on the Gender Social Norms Index (GSNI), which ranges from 0 (complete equality) to 100 (maximum perceived inequality). Coefficients are thus interpreted as marginal changes associated with a one-point increase in gender bias.

The effect of maternity leave days on FLFP is shaped by the level of gender bias. While the baseline coefficient is negative and statistically insignificant, the inclusion of interaction terms with GSNI reveals a nonlinear pattern:

- The linear interaction is negative but not statistically significant.
- The quadratic interaction is positive and statistically significant, suggesting a modest U-shaped curvature.

Marginal effects computed across the GSNI range indicate that an additional day of maternity leave is associated with a modest but positive increase in FLFP across most contexts. The effect diminishes as gender bias intensifies—ranging from approximately +0.40 percentage points in more egalitarian societies to around +0.10–0.20 points in more discriminatory ones.

This attenuation likely reflects institutional and cultural constraints that limit women's reintegration into the labor market, particularly in contexts where traditional gender norms remain strong.

Paternity leave shows a strong and statistically significant positive average effect on FLFP, but this benefit diminishes significantly as gender bias increases:

- The interaction with GSNI is negative and significant.
- Due to collinearity, the quadratic term cannot be estimated in the full model; however, it becomes significant in a reduced specification and suggests a slight upward curvature.

Across the GSNI spectrum, the effect of paternity leave declines from +0.55 percentage points (GSNI = 0) to –0.10 points (GSNI = 100). This confirms that paternity leave is most effective where cultural norms already support shared caregiving responsibilities. In less egalitarian contexts, legal entitlements alone appear insufficient to shift behavior.

For shared parental leave, no significant interaction with GSNI is observed. This likely reflects persistently gendered uptake patterns: despite being formally available to both parents, shared leave is still predominantly used by mothers. Without targeted incentives,

such as non-transferable quotas or financial bonuses, this policy does little to alter traditional intra-household labor divisions.

Counterfactual Simulation: Supporting Evidence for H2

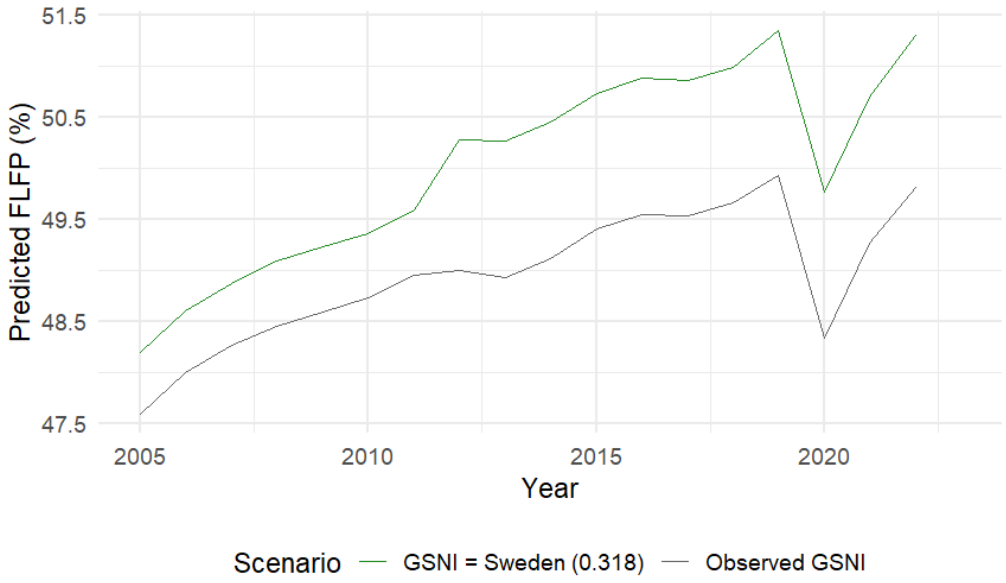
Building on the interaction models, a counterfactual simulation was developed to quantify the role of gender norms as structural enablers—or constraints—of policy effectiveness. Specifically, the simulation estimates how FLFP would change if all countries had Sweden's GSNI level (0.318), while keeping all other factors constant. This exercise directly tests Hypothesis 2, which posits that policy effects are moderated by prevailing gender norms.

The results show that adopting more egalitarian norms would be associated with a moderate but consistent increase in FLFP, averaging between 1.5% and 2% across the observed years. This suggests that cultural context not only shapes but conditions the effectiveness of policy instruments like paternity leave. The gap in predicted FLFP widens notably over time—except during the 2020–2021 period, likely reflecting COVID-related disruptions—and highlights the latent potential of policy reforms when implemented in supportive normative environments.

A detailed explanation of the simulation methodology is provided in Appendix A.

Figure 4.4 – Predicted FLFP Under Observed vs. Counterfactual GSNI Scenarios (2005–2022)

Predicted trajectories of female labor force participation (FLFP) based on interaction models between parental leave policies and gender norms. The black line represents predicted FLFP using each country's actual GSNI score, while the green line simulates a counterfactual scenario where all countries are assigned Sweden's GSNI value (0.318), holding all other variables constant. The widening gap over time illustrates how lower gender bias amplifies the labor market impact of family policies, highlighting the importance of normative context for policy effectiveness.



While these results lend support to Hypothesis 2 and align with the theoretical framework outlined in Chapter 2, they should be interpreted as indicative rather than definitive. The estimated effects reflect conditional associations, shaped by cross-national variation in legal entitlements and cultural norms, but do not capture actual policy uptake or intra-country normative change. The use of a time-invariant GSNI and aggregate FLFP indicators introduces limitations that may attenuate observed relationships, particularly in the short term.

Nonetheless, the consistency in direction and magnitude across models highlights a central insight of this thesis: policy effectiveness is not solely a function of legal design but critically depends on the cultural environment in which reforms are embedded.

Structural gender norms can enable or constrain the labor market impact of family policies, reinforcing the idea that legislative change must be accompanied by broader normative transformation to produce lasting effects.

(b) Heterogeneity by Economic Development (log GDP per capita)

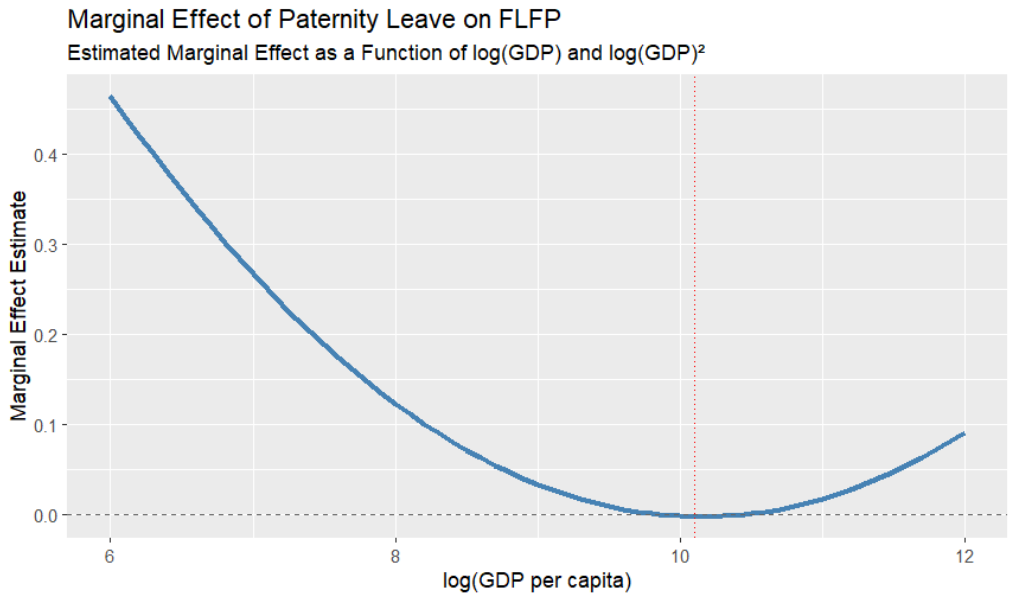
To empirically test Hypothesis 3, the analysis investigates whether the effectiveness of parental leave policies varies across levels of economic development. The results confirm a clear pattern of heterogeneity.

The marginal impact of paternity leave follows a U-shaped curve: the baseline effect is positive and significant ($\beta = +2.801$, $p = 0.032$), with a negative interaction with log (GDP) ($\beta = -0.553$, $p = 0.021$) and a positive quadratic term ($\beta = +0.027$, $p = 0.013$). In low-income countries, even modest reforms—such as introducing a few days of paternity leave—can have a meaningful effect. These settings are often characterized by weak labor protections and high levels of necessity-driven female labor force participation. In this context, the formal recognition of fathers' caregiving roles can act as a powerful symbolic shift, easing the domestic burden on women and enabling their continued employment.

In middle-income settings, however, the impact of paternity leave diminishes. Although legal provisions may exist, they are often poorly enforced, culturally stigmatized, or insufficiently supported by employers, limiting their ability to affect behavior or labor outcomes.

In high-income contexts, the effect rises again. Institutional capacity, stronger legal enforcement, and more egalitarian norms promote greater uptake of paternity leave. This contributes to more equitable divisions of labor and supports maternal re-entry into the workforce. These dynamics confirm that paternity leave is most effective when embedded within systems that are both culturally receptive and institutionally robust.

Figure 4.5 – Marginal Effect of Paternity Leave on FLFP Across Levels of log (GDP) The figure displays a U-shaped relationship between the effectiveness of paternity leave and log(GDP) per capita. The marginal effect is strongest in low- and high-income settings and weakest at intermediate development levels, confirming the non-linear interaction.



For maternity leave, the pattern is reversed: the estimated relationship is inverted U-shaped. The base coefficient is negative ($\beta = -0.302$, $p = 0.0078$), with a positive interaction ($\beta = +0.068$, $p = 0.0125$) and a negative quadratic term ($\beta = -0.0038$, $p = 0.0186$). This suggests that maternity leave is most beneficial—or least harmful—at intermediate stages of development.

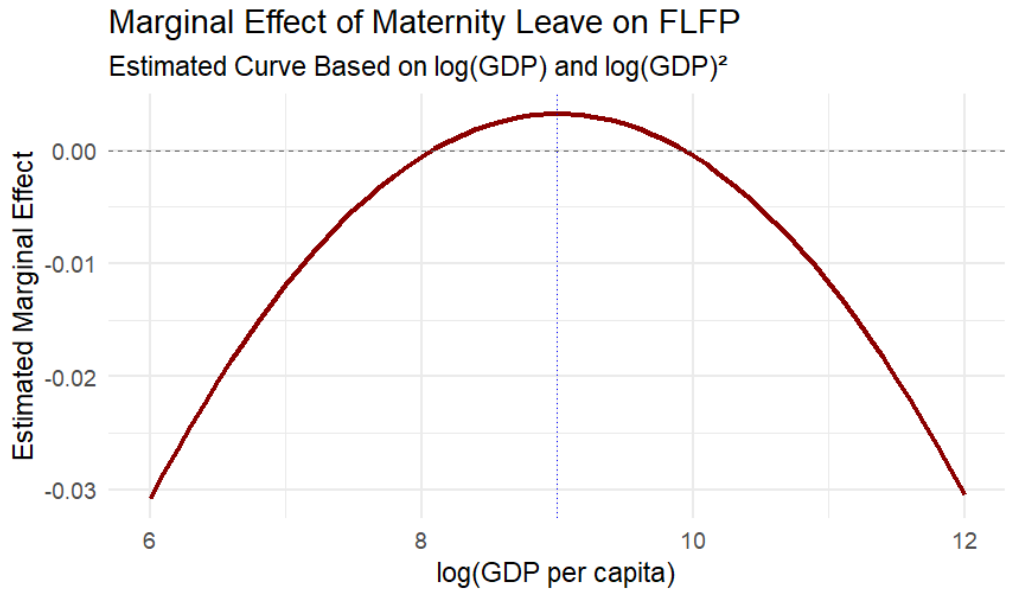
In low-income contexts, maternity leave may inadvertently reduce FLFP. Formal protections are often absent or unenforced, and job reintegration is uncertain. Without access to childcare or income support, women may exit the labor force permanently after childbirth—even when leave is legally available.

In middle-income countries, improving formal employment and emerging support structures (e.g., part-time work, childcare) make maternity leave more effective in supporting employment continuity.

In high-income countries, however, long or rigid maternity leave entitlements can have unintended effects. Some women may delay returning to work or face career penalties due

to prolonged absences, reinforcing occupational segregation. ILO data show that the motherhood penalty remains sizable in high- and upper-middle-income countries—driven not by lack of access, but by trade-offs between caregiving and career advancement.

Figure 4.6 – Marginal Effect of Maternity Leave on FLFP Across Levels of log(GDP) The figure shows an inverted U-shaped effect of maternity leave. The marginal impact is most positive at intermediate levels of development, while low- and high-income contexts display weaker or even negative effects.



No significant interaction is found between shared parental leave and GDP per capita. This mirrors the findings from the GSNI analysis and reinforces the idea that without structural incentives—such as dedicated quotas for fathers—shared leave fails to alter traditional caregiving patterns, regardless of income level.

These results offer strong empirical support for Hypothesis 3: the labor market effects of parental leave policies are not uniform but vary substantially across levels of development. Paternity leave is effective at both ends of the income spectrum—either by catalyzing cultural change or reinforcing existing egalitarian norms—while maternity leave shows benefits only in transitional stages.

Crucially, the lack of impact from shared leave underlines a broader lesson: policy design alone is not enough. To be effective, parental leave must be aligned with both institutional capacity and prevailing cultural expectations.

As with the GSNI analysis, these findings should be interpreted with caution. First, the use of legal entitlements (de jure) rather than actual policy uptake (de facto), and the reliance on aggregate FLFP rather than subgroup-specific measures (e.g. new mothers), may attenuate observed effects. Second, potential endogeneity remains a concern: economic development, institutional capacity, and gender equality may co-evolve, making it difficult to fully isolate the direction of causality. While the inclusion of fixed effects and interaction terms helps mitigate some of these risks, the results are best understood as indicative patterns rather than definitive causal impacts.

Ultimately, economic development and gender norms are two sides of the same coin. Both shape the conditions under which formal entitlements translate into real labor market gains. The findings highlight that meaningful progress toward gender equality requires not just legal reform, but context-sensitive implementation and sustained cultural transformation.

4.5 Placebo Test: Youth Male LFPR

To reinforce the internal validity of the identification strategy used in the main models, a placebo test was conducted using an outcome variable theoretically unaffected by parental leave reforms: the labor force participation rate of young males aged 15 to 24.

This demographic is unlikely to be directly influenced by such policies, as they typically fall outside the reproductive age and are generally not involved in caregiving responsibilities. The rationale behind this approach is straightforward: if the estimated effects of maternity, paternity leave or shared leave were merely capturing broader labor market trends or unobserved time-varying shocks, we would expect to see similar effects on youth male labor force participation. Conversely, a null result would support the credibility of the main findings by indicating that the observed associations are specific to the targeted population.

The placebo analysis employed a two-way fixed effects model, with country and year fixed effects and robust standard errors clustered at the country level. The specification mirrored the baseline regression used throughout the main analysis, with the dependent variable replaced by youth male labor force participation. The regression results are summarized in Table 4.2.

The estimated coefficient for paternity leave is –0.0016 ($p = 0.796$), statistically insignificant and substantively negligible. This aligns with theoretical expectations and suggests that the positive effect observed in the main models is not an artifact of broader labor market dynamics. The coefficient for shared parental leave is similarly small and statistically insignificant (+0.0004, $p = 0.887$), further reinforcing the validity of the identification strategy: a policy component targeted at caregiving couples has no detectable impact on a demographic group unlikely to be affected by such policies. The coefficient for maternity leave, however, is +0.0061 ($p = 0.016$), statistically significant at the 5% level. While this result may raise questions, its magnitude is extremely small, and there is no theoretical justification for expecting maternity leave to affect the labor supply behavior of young males. This marginal significance could stem from residual cross-country heterogeneity not fully captured by the fixed effects, compositional macro-level patterns (e.g., countries with higher female labor force participation may also exhibit more stable youth employment), or simple statistical noise given the large sample size. Importantly, the model explains over 90% of the variation in youth male labor force participation (Adjusted $R^2 = 0.902$), indicating that the included controls and fixed effects account for the primary drivers of this outcome.

Taken together, the placebo test lends further support to the main analysis. The absence of significant effects for both paternity leave and shared parental leave on an unrelated population strengthens confidence in the causal interpretation of the main results. The weak significance observed for maternity leave does not undermine the core findings but rather highlights the need for careful interpretation when working with macro-level panel data, where residual heterogeneity and compositional patterns may generate marginal statistical noise. Overall, the analysis confirms that the estimated effects of parental leave policies are not spuriously driven by general labor market trends, but are plausibly linked to the specific populations and mechanisms targeted by the reforms.

Table 4.2 – Placebo Test: Effects of Parental Leave on Youth Male Labor Force Participation (Ages15–24)

Results from a two-way fixed effects regression with country and year fixed effects. The dependent variable is the labor force participation rate of males aged 15–24. Explanatory variables include days of maternity, paternity and shared leave, log GDP per capita, and fertility rate. Robust standard errors are clustered at the country level. Coefficients reflect the marginal effect of an additional day of parental leave entitlement.

VARIABLES	(1) Placebo: Youth Male LFPR
Days for Mother	0.0062** (0.0025)
Days for Father	−0.0016 (0.0063)
Shared days	0.0004 (0.0025)
log GDP	−1.3289* (0.6372)
Fertility Rate	0.7655 (0.7525)
Observations	5,787
R-squared	0.902
Number of country_id	178

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

5 Conclusions

This thesis has examined the causal impact of parental leave policies on female labor force participation (FLFP) across 178 countries between 1990 and 2023. Using a robust empirical strategy—combining fixed effects estimators, event study models, and staggered Difference-in-Differences (DiD) techniques—the study assessed the comparative effectiveness of maternity versus paternity leave and explored how gender norms and economic development shape policy outcomes.

The findings consistently highlight paternity leave as the most effective instrument for increasing FLFP. In the fixed effects models, each additional day of paid leave for fathers is associated with a statistically significant increase of +0.0135 percentage points in women's participation. While event studies show limited short-term changes, the staggered DiD models reveal long-run gains exceeding +3 percentage points, peaking 18 to 21 years after implementation. These effects are both substantial and gender-specific, as confirmed by placebo tests on male youth participation.

By contrast, maternity leave exhibits weaker and more variable effects. Most estimates are small, often insignificant, and temporary. Although some middle-income countries experience short-term gains, the overall pattern suggests maternity leave helps with immediate labor reintegration but does not shift long-term employment trends. Similarly, shared parental leave shows no measurable effect—likely due to low male uptake and limited institutional incentives for fathers.

One of the study's main contributions is its analysis of heterogeneity across contexts. First, gender norms, as measured by the Gender Social Norms Index (GSNI), significantly influence policy effectiveness. In egalitarian countries, paternity leave has stronger impacts, while in high-bias settings, its effectiveness is muted. A simulation indicates that if all countries matched Sweden's level of gender equality, global FLFP would rise by 1.5 to 2 percentage points.

Second, the interaction with income levels follows a non-linear pattern. For paternity leave, effects are strongest in low- and high-income countries, and weakest in middle-income

settings—where enforcement may be poor or social resistance high. Maternity leave, conversely, follows an inverted U-shape, being most effective where formal employment is emerging but still flexible. In all cases, shared leave underperforms across income groups.

These insights contribute to broader debates in gender and institutional economics. They offer empirical support for the redistribution hypothesis, which emphasizes the role of policies directed at fathers. The results also reinforce the value of context-sensitive evaluation in social policy, and demonstrate the utility of staggered DiD estimators for global comparative analysis.

Well-designed parental leave schemes—particularly those that actively engage fathers—can significantly enhance women's labor market outcomes. However, effectiveness depends not just on legislation, but on cultural acceptance, institutional capacity, and strategic policy design. Five policy recommendations emerge:

1. Introduce Non-Transferable Paternity Leave Quotas
   Reserve a share of paid leave exclusively for fathers, with wage replacement and job protection, to ensure meaningful uptake.
   Empirical basis: Long-run FLFP gains of +3–4 percentage points emerge 15–20 years post-adoption in countries with strong enforcement.

2. Calibrate Leave Duration Carefully
   Avoid overly long or short maternity leave; 3–6 months of well-paid leave supports participation without career penalties.
   Empirical basis: Effects follow an inverted-U shape, with strongest gains in middle-income settings.

3. Integrate Leave with Broader Support Systems
   Maximize impact through affordable childcare, flexible work, and reintegration mechanisms.
   Empirical basis: Stronger institutions and formal markets amplify leave effectiveness.

4. Enforce and Track Male Uptake
   Monitor use, reduce stigma, and engage employers to normalize paternity leave.
   Empirical basis: No FLFP impact observed where GSNI is high and male uptake is low.

5. Support Legal Reform with Cultural Change
   Complement policies with public campaigns, education, and leadership by example.
   Empirical basis: If countries matched Sweden's GSNI score, FLFP could rise globally by 1.5–2 points.

While these findings provide strong policy insights, the study also has limitations. It focuses solely on FLFP, leaving out other labor outcomes such as wages, mobility, or working hours, which matter for employment quality. The use of legal entitlements does not reflect actual uptake, and the aggregate nature of the data may obscure differences within countries (e.g., by sector, education, or motherhood status). Finally, despite careful modeling, endogeneity remains a concern: policy reforms may reflect deeper, unobserved societal changes.

In conclusion, paternity leave—when well-designed and embedded in the right social and institutional context—can drive long-term progress in gender equality. Yet policies alone are insufficient. Real change requires the alignment of law, culture, and infrastructure. Only through this multidimensional integration can parental leave policies deliver on their full transformative potential.

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7 Appendix A

Table 1 – Average Paid Leave Entitlements and Female Labor Force Participation by Region (1990–2023)
Mean and standard deviation of maternity leave, paternity leave, shared parental leave, and female labor force participation across world regions.
Source: Author's calculations based on WBL 2024 Historical Panel and ILOSTAT data.

Region	Avg. Days for Mother	Avg. Days for Father	Avg. Shared Days	Avg. FLFP (%)	SD – Mother Days	SD – Father Days	SD – Shared Days	SD – FLFP
East Asia & Pacific	4.84	0.01	3.5	57.13	72.62	0.27	59.39	12.01
Europe - Central Asia	20.0	2.61	256.24	49.63	90.4	15.67	374.9	10.15
OECD	29.59	29.4	152.25	53.0	71.77	75.03	257.99	7.27
Latin America-Caribbean	0.0	0.0	0.09	49.28	0.0	0.0	1.92	9.23
MENA	0.12	0.12	0.0	24.65	2.35	2.35	0.0	12.62
South Asia	0.0	0.0	0.0	31.25	0.0	0.0	0.0	13.26
Sub-Saharan Africa	0.0	0.0	0.0	58.25	0.0	0.0	0.0	16.66
Total	8.57	5.94	59.72	49.71	51.79	35.14	195.63	16.25

Table 2 – Year of Maternity Leave Reform by Country
List of countries included in the maternity leave treatment sample, with the corresponding year of first legal adoption or reform.
Source: Author's compilation based on WBL 2024 Historical Panel.

Country Code	Year of Treatment
NOR	1990
SWE	1996
TJK	1998
BEL	1999
LUX	2000
ITA	2002
KOR	2003
SVN	2003
DEU	2008
HRV	2010
PRT	2010

JPN	2011
CHL	2013
ROU	2013
FRA	2016
MNG	2019
USA	2019
CAN	2020
ARE	2021
IRL	2021
GRC	2022
ISL	2022
CHN	2023
DNK	2023
FIN	2023
MLT	2023
NLD	2023

Table 3– Year of Paternity Leave Reform by Country
List of countries included in the paternity leave treatment sample, with the corresponding year of first legal adoption or reform.
Source: Author's compilation based on WBL 2024 Historical Panel.

Country Code	Year of Treatment
NOR	1996
SWE	1996
BEL	1999
LUX	2000
ITA	2001
KOR	2003
SVN	2003
DEU	2008
HRV	2010
PRT	2010
JPN	2012
ROU	2013
FRA	2016
USA	2019
CAN	2020
ARE	2021
EST	2021
IRL	2021
GRC	2022
ISL	2022
CHN	2023
DNK	2023
FIN	2023
MLT	2023
NLD	2023

Figure 1 – Distribution of Maternity and Paternity Leave Reforms Over Time
Number of countries introducing leave policies by year, based on legal adoption data from 1990 to 2023. The peak observed in 2023 reflects a wave of recent reforms clustered in that year. *Source:* Author's calculations based on WBL 2024 Historical Panel.

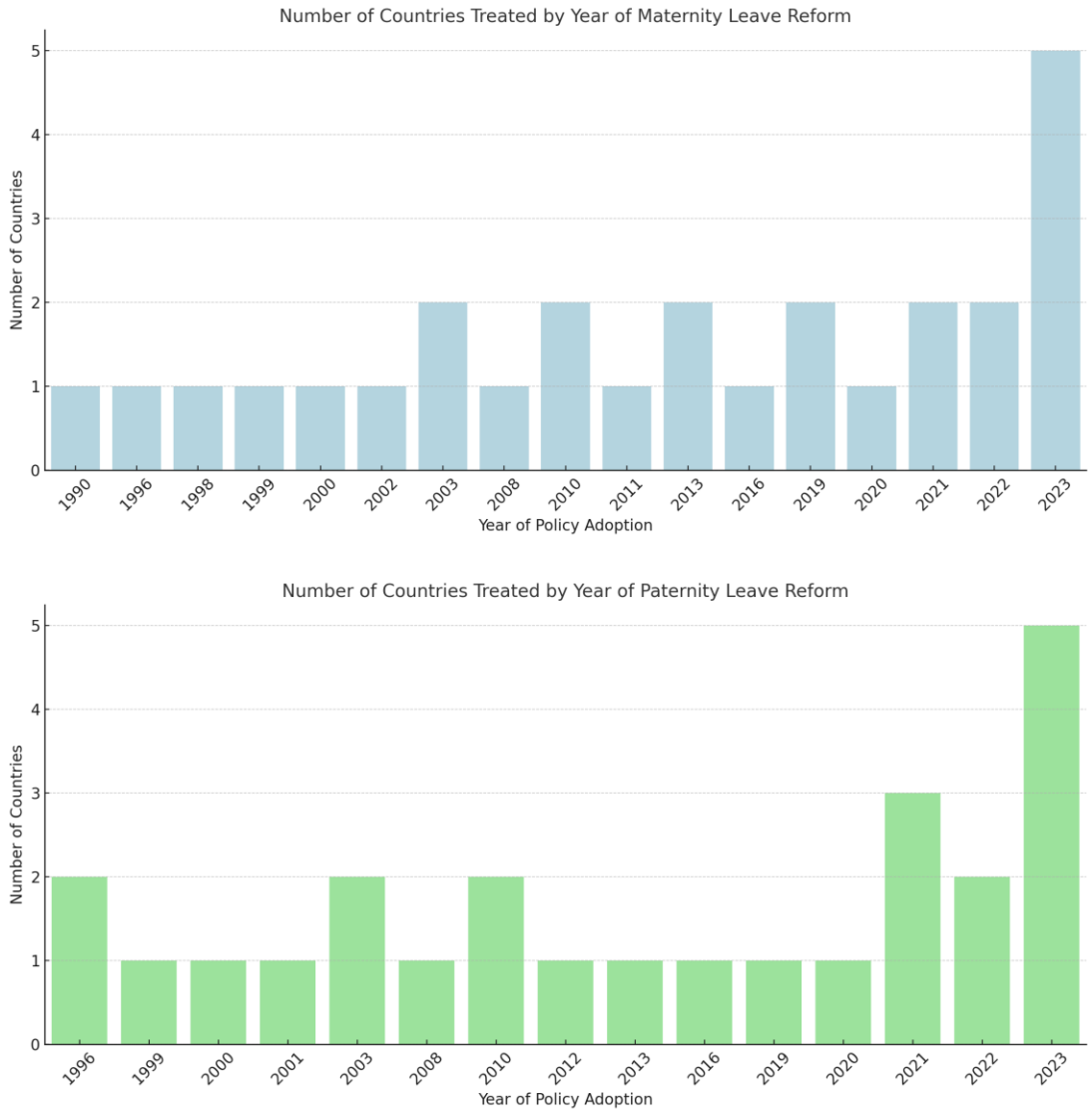

Table 4 – Full Dynamic ATT Estimates for Maternity Leave Reform
This table reports the dynamic average treatment effects (ATT) relative to the introduction or reform of maternity leave. Each row shows the event time, estimate, standard error, confidence intervals, and significance. All numeric values are rounded to four decimal places for clarity. *Source:* Author's calculations based on staggered DiD estimation using WBL 2024 Historical Panel and ILOSTAT data.

event_time	estimate	se	ci_lower	ci_upper	significant
-31.0000	-1.6842	0.6015	-2.8632	-0.5052	*
-30.0000	1.7764	0.5821	0.6355	2.9172	nan
-29.0000	0.0448	0.2385	-0.4227	0.5122	nan
-28.0000	-0.0622	0.3342	-0.7173	0.5929	nan
-27.0000	0.8016	0.4732	-0.1258	1.7290	*
-26.0000	-0.2132	0.6604	-1.5076	1.0812	nan
-25.0000	-0.3088	0.3157	-0.9276	0.3100	nan
-24.0000	0.7325	0.3820	-0.0163	1.4813	nan
-23.0000	0.3096	0.2436	-0.1677	0.7870	*
-22.0000	0.4716	0.4313	-0.3738	1.3170	nan
-21.0000	-0.4381	0.2707	-0.9687	0.0925	nan
-20.0000	-0.0781	0.2889	-0.6444	0.4881	nan
-19.0000	0.5232	0.4912	-0.4396	1.4860	nan
-18.0000	-0.2938	0.5326	-1.3377	0.7502	nan
-17.0000	0.5272	0.3051	-0.0707	1.1252	nan
-16.0000	0.2473	0.1630	-0.0721	0.5667	nan
-15.0000	-0.1724	0.1890	-0.5428	0.1980	nan
-14.0000	0.1717	0.2422	-0.3031	0.6465	nan
-13.0000	0.3717	0.2144	-0.0486	0.7919	nan
-12.0000	0.4865	0.2244	0.0466	0.9264	nan

-11.0000	0.0063	0.1725	-0.3317	0.3444	nan
-10.0000	0.1072	0.1930	-0.2711	0.4855	nan
-9.0000	0.1493	0.2556	-0.3517	0.6502	nan
-8.0000	0.2754	0.1977	-0.1122	0.6629	*
-7.0000	0.3536	0.2052	-0.0486	0.7558	*
-6.0000	0.2701	0.2047	-0.1311	0.6714	nan
-5.0000	-0.4948	0.3049	-1.0925	0.1028	nan
-4.0000	-0.6843	0.4079	-1.4838	0.1152	nan
-3.0000	0.2524	0.3910	-0.5140	1.0187	nan
-2.0000	-0.1710	0.2094	-0.5814	0.2394	nan
-1.0000	0.6325	0.4544	-0.2582	1.5231	nan
0.0000	-0.8576	1.5908	-3.9756	2.2603	nan
1.0000	-0.8283	1.1428	-3.0682	1.4117	nan
2.0000	-0.8509	0.9134	-2.6411	0.9394	nan
3.0000	-0.1431	1.0895	-2.2786	1.9923	nan
4.0000	0.7017	1.6072	-2.4484	3.8518	nan
5.0000	1.4510	1.4363	-1.3640	4.2661	nan
6.0000	2.0331	1.8294	-1.5525	5.6188	nan
7.0000	2.0142	1.3574	-0.6462	4.6747	nan
8.0000	2.2747	1.8655	-1.3817	5.9311	nan
9.0000	2.6264	2.0541	-1.3996	6.6524	nan
10.0000	2.6557	1.9874	-1.2397	6.5510	nan
11.0000	3.1736	2.1643	-1.0685	7.4157	nan
12.0000	3.2614	1.8642	-0.3924	6.9152	nan
13.0000	2.8015	1.9257	-0.9730	6.5759	nan

14.0000	2.7845	1.9941	-1.1239	6.6929	nan
15.0000	3.2311	2.0147	-0.7178	7.1800	nan
16.0000	3.4144	2.1113	-0.7238	7.5526	nan
17.0000	3.6808	1.9479	-0.1371	7.4986	nan
18.0000	3.9624	1.9205	0.1981	7.7266	nan
19.0000	4.4476	1.8137	0.8927	8.0026	nan
20.0000	3.9935	1.8245	0.4175	7.5696	nan
21.0000	3.8038	1.4717	0.9192	6.6883	nan
22.0000	4.0151	1.6053	0.8687	7.1615	nan
23.0000	2.4427	1.7262	-0.9406	5.8260	nan
24.0000	2.1751	1.9112	-1.5708	5.9211	nan
25.0000	2.6748	2.0181	-1.2806	6.6303	nan
26.0000	0.8563	1.2176	-1.5301	3.2428	nan

Table 5 – Full Dynamic ATT Estimates for Paternity Leave Reform
This table reports all dynamic ATT estimates related to paternity leave reform. Values are formatted to four decimal places. Significance is marked with an asterisk where applicable. *Source:* Author's calculations based on WBL 2024 Historical Panel and ILOSTAT data.

event_time	estimate	se	ci_lower	ci_upper	significant
-31.0000	-1.6842	0.6015	-2.8632	-0.5052	*
-30.0000	1.7764	0.5821	0.6355	2.9172	*
-29.0000	0.0448	0.2385	-0.4227	0.5122	nan
-28.0000	-0.0622	0.3342	-0.7173	0.5929	nan
-27.0000	0.8016	0.4732	-0.1258	1.7290	nan
-26.0000	-0.2132	0.6604	-1.5076	1.0812	nan
-25.0000	-0.3088	0.3157	-0.9276	0.3100	nan
-24.0000	0.7325	0.3820	-0.0163	1.4813	nan

-23.0000	0.3096	0.2436	-0.1677	0.7870	nan
-22.0000	0.4716	0.4313	-0.3738	1.3170	nan
-21.0000	-0.4381	0.2707	-0.9687	0.0925	nan
-20.0000	-0.0781	0.2889	-0.6444	0.4881	nan
-19.0000	0.5232	0.4912	-0.4396	1.4860	nan
-18.0000	-0.2938	0.5326	-1.3377	0.7502	nan
-17.0000	0.5272	0.3051	-0.0707	1.1252	nan
-16.0000	0.2473	0.1630	-0.0721	0.5667	nan
-15.0000	-0.1724	0.1890	-0.5428	0.1980	nan
-14.0000	0.1717	0.2422	-0.3031	0.6465	nan
-13.0000	0.3717	0.2144	-0.0486	0.7919	nan
-12.0000	0.4865	0.2244	0.0466	0.9264	*
-11.0000	0.0063	0.1725	-0.3317	0.3444	nan
-10.0000	0.1072	0.1930	-0.2711	0.4855	nan
-9.0000	0.1493	0.2556	-0.3517	0.6502	nan
-8.0000	0.2754	0.1977	-0.1122	0.6629	nan
-7.0000	0.3536	0.2052	-0.0486	0.7558	nan
-6.0000	0.2701	0.2047	-0.1311	0.6714	nan
-5.0000	-0.4948	0.3049	-1.0925	0.1028	nan
-4.0000	-0.6843	0.4079	-1.4838	0.1152	nan
-3.0000	0.2524	0.3910	-0.5140	1.0187	nan
-2.0000	-0.1710	0.2094	-0.5814	0.2394	nan
-1.0000	0.6325	0.4544	-0.2582	1.5231	nan
0.0000	-0.8576	1.5908	-3.9756	2.2603	nan
1.0000	-0.8283	1.1428	-3.0682	1.4117	nan

2.0000	-0.8509	0.9134	-2.6411	0.9394	nan
3.0000	-0.1431	1.0895	-2.2786	1.9923	nan
4.0000	0.7017	1.6072	-2.4484	3.8518	nan
5.0000	1.4510	1.4363	-1.3640	4.2661	nan
6.0000	2.0331	1.8294	-1.5525	5.6188	nan
7.0000	2.0142	1.3574	-0.6462	4.6747	nan
8.0000	2.2747	1.8655	-1.3817	5.9311	nan
9.0000	2.6264	2.0541	-1.3996	6.6524	nan
10.0000	2.6557	1.9874	-1.2397	6.5510	nan
11.0000	3.1736	2.1643	-1.0685	7.4157	nan
12.0000	3.2614	1.8642	-0.3924	6.9152	nan
13.0000	2.8015	1.9257	-0.9730	6.5759	nan
14.0000	2.7845	1.9941	-1.1239	6.6929	nan
15.0000	3.2311	2.0147	-0.7178	7.1800	nan
16.0000	3.4144	2.1113	-0.7238	7.5526	nan
17.0000	3.6808	1.9479	-0.1371	7.4986	nan
18.0000	3.9624	1.9205	0.1981	7.7266	*
19.0000	4.4476	1.8137	0.8927	8.0026	*
20.0000	3.9935	1.8245	0.4175	7.5696	*
21.0000	3.8038	1.4717	0.9192	6.6883	*
22.0000	4.0151	1.6053	0.8687	7.1615	*
23.0000	2.4427	1.7262	-0.9406	5.8260	nan
24.0000	2.1751	1.9112	-1.5708	5.9211	nan
25.0000	2.6748	2.0181	-1.2806	6.6303	nan
26.0000	0.8563	1.2176	-1.5301	3.2428	nan

Methodology for Counterfactual Simulation Based on Gender Norms

The goal of this counterfactual exercise is to estimate how female labor force participation (FLFP) would have evolved if all countries had shared the same level of gender norms as Sweden, as measured by the Gender Social Norms Index (GSNI). Specifically, the GSNI value used for Sweden is 0.318. All other characteristics—economic, demographic, institutional—are held constant.

Methodological Steps

1. Data Preparation:

   The dataset was cleaned by removing observations with missing values on key variables. Two interaction terms were created to model potential non-linear effects:

   - DaysForTheFather × GSNI
   - DaysForTheFather × $GSNI^2$

2. Model Estimation (Fixed Effects Panel Regression):
   The model includes country and year fixed effects to control for unobserved heterogeneity across countries and time. This specification allows us to isolate how paternal leave policies interact with social norms (GSNI) in shaping women's labor market participation.

3. Extraction of Model Coefficients
   All estimated coefficients were extracted, including those for the interaction terms and control variables (log GDP per capita and fertility rate).

4. Prediction of Observed and Counterfactual Outcomes:
   Two predicted FLFP values were computed for each country-year observation:

   - Observed prediction: using actual GSNI values (flfp_fitted_observed)
   - Counterfactual prediction: setting GSNI = 0.318 for all countries (flfp_fitted_counterfactual)

These predictions incorporate country and year fixed effects, preserving the panel structure.

5. Annual Aggregation:
   For each year, the following statistics were computed:

   - Average predicted FLFP under observed GSNI

- Average predicted FLFP under counterfactual GSNI = 0.318
- Percentage difference between the two:

diff_pct = (flfp_swedish - flfp_policy) / flfp_policy * 100

6. Visualization:
   A line chart was produced to compare the two trajectories over time:
   - Gray line: FLFP predicted with observed GSNI
   - Green line: FLFP predicted with GSNI fixed at Swedish level

The analysis is restricted to post-2005 data to ensure comparability and capture the most active policy period.

The counterfactual analysis reveals that aligning gender norms with those observed in Sweden would lead to a moderate but consistent increase in female labor force participation, estimated at 1.5–2% on average. This suggests that legal reforms alone may not be sufficient: cultural and normative change is a critical complement for achieving gender equality in labor markets.