

## Different models of the relationship between women's fertility and employment.

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**Abstract**

This article examines the complex relationship between women's employment and fertility, a central topic in labor and family economics. The analysis draws on economic and sociological theoretical frameworks to understand the factors influencing women's choices between career and family life. The multidimensional nature of this relationship is highlighted through the study of economic, sociocultural, and institutional contexts, which vary across regions and time periods. The study employs classical economic theories, notably Becker's model based on opportunity costs, as well as sociological approaches such as Parsons' social role theory and Kergoat's concept of the "double workday." These different theoretical perspectives allow for an analysis of how gender norms and societal expectations influence women's decisions regarding fertility and employment. The empirical results reveal nuanced conclusions. While some studies establish a negative correlation between female employment and fertility, others identify contexts where these two dimensions coexist harmoniously, particularly through favorable family policies, egalitarian ideologies, and efficient childcare systems. Recent models, incorporating dynamic and stochastic approaches, help refine these analyses by taking into account labor market structures, individual preferences, and the impact of public policies. The originality of this research lies in its interdisciplinary approach, combining economic and sociological perspectives to provide a more comprehensive understanding of the work-fertility relationship. Furthermore, its value stems from the integration of contemporary dynamic modeling techniques that offer new insights for policymakers seeking to support both women's employment and fertility goals.

**Keywords:** Fertility, Women's Employment, Public Policies, Opportunity Costs

## Introduction

The evolution of women's role in contemporary society raises fundamental questions about the interaction between professional life and family choices. This transformation, which has accelerated since the second half of the 20th century, has profoundly modified traditional family and professional dynamics. Indeed, the relationship between fertility and women's employment, historically considered antagonistic, reveals today a complexity that merits in-depth analysis. This dynamic is not limited to a simple negative correlation, as traditional theories assumed, but is part of a set of socioeconomic, cultural, and political factors that vary considerably across national contexts.

Moreover, the massive entry of women into the labor market has been one of the most significant social changes of the 20th century, disrupting traditional family patterns and modes of social organization. While early studies from the 1980s established an almost systematic negative link between female employment and fertility, more recent observations challenge this deterministic view. The societal transformations of recent decades, accompanied by innovative public policies in certain countries, have given rise to configurations where professional career and motherhood are no longer necessarily incompatible. This evolution demonstrates a progressive adaptation of societies and institutions to women's new aspirations, even though significant challenges persist.

The diversity of situations observed worldwide illustrates the complexity of this relationship. Indeed, some countries, particularly in Northern Europe, have managed to maintain relatively high fertility rates while ensuring strong female participation in the labor market. Conversely, other nations continue to face major difficulties in reconciling professional and family life, often leading to difficult trade-offs for women.

This article aims to examine this complex relationship through three main axes. First, we will analyze the historical evolution of the relationship between female employment and fertility, highlighting the major changes observed since the 1980s. This diachronic approach will help understand how perceptions and realities have evolved over time. Next, we will study the diversity of national contexts and their influence on this dynamic, comparing different societal models and their impacts on women's choices. Finally, we will explore the role of public policies and institutional factors in reconciling professional and family life, identifying the mechanisms that seem most effective in supporting both female employment and fertility choices. This in-depth analysis aims not only to enrich our understanding of these complex dynamics but also to inform policymakers about possible levers of action to promote better

reconciliation between women's professional and family aspirations in our contemporary societies.

## **1.Theoretical Approaches to the Relationship Between Fertility and Women's Employment**

### **1.1 Conceptual Foundations**

Several theoretical works highlight the relationship between fertility and women's employment, a theme explored through various economic, sociological, and demographic theories. This complex relationship reflects multidimensional dynamics where individual choices, social structures, and economic contexts interact closely.

#### **1.1.1 Interactions Between Fertility and Women's Employment: An Analysis of Demographic and Social Dynamics**

The study of the relationship between fertility and women's participation in the labor market has particularly developed with the industrialization of societies. Theoretical works employ various approaches to understand this complex dynamic. Among these theories, the theory of demographic transition occupies a central place. It describes how societies evolve from a regime characterized by high fertility and mortality rates to a model where both levels become low. This process, closely linked to industrialization, urbanization, and improvements in living conditions, alters family structures and gender roles. For instance, in contexts where infant mortality decreases and education becomes more accessible, families tend to reduce the number of children to invest more in their well-being and future. This theory thus highlights a significant relationship between women's employment and fertility, suggesting that increased participation of women in the labor market is correlated with lower fertility rates and changes in family structures (Z., Kh., Valitova, 2023).

The rational choice theory offers an individualistic approach to understanding these phenomena. According to this perspective, individuals and families make decisions about having children based on anticipated costs and benefits. Women, in particular, have the ability to balance the time and resources allocated to motherhood against those needed for their careers or personal fulfillment. Access to resources such as childcare services, parental leave policies, and job opportunities plays a crucial role in these decisions (Aghaziarati and Faramarzi, 2024). This theory also critiques the assumption of women's irrationality<sup>1</sup> in decisions related to

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<sup>1</sup> The hypothesis of women's irrationality, which has deep historical roots, often stems from patriarchal viewpoints that depict women as emotional and less capable of logical reasoning than men. This stereotype has persisted in various fields, including psychology, sociology, and economics. This perspective suggests that women make

sexuality and reproduction, emphasizing the need to understand the true causes of unintended pregnancies in order to improve family planning and contraception services (Elizabeth, Anderson, 2018). In this regard, Kristin Luker's study, "Taking Chances" (1975), particularly illustrates this challenge. Her research, conducted in the early 1970s in California, demonstrates that women's decisions regarding sexuality and contraceptive use are informed and rational.

From a more sociological perspective, Parsons' theory of social roles, developed in the 1950s, applies to the analysis of interactions between fertility and women's employment. This theory examines how social expectations, such as gender roles, influence behaviors. For example, in societies where patriarchal norms dominate, women may be encouraged to prioritize their roles as mothers and wives, thereby limiting their participation in the labor market. Conversely, in contexts where norms evolve to promote gender equality, women are better able to balance professional and family life, often supported by appropriate public policies.

In this social framework, Danièle Kergoat's theory of the "double burden," formulated in the 1970s, provides valuable insight into the tensions faced by modern women. This theory highlights the challenges they encounter when trying to reconcile professional and domestic responsibilities. In many cases, this additional burden acts as a deterrent to fertility, particularly when institutional or familial support systems are inadequate. Thus, the interactions between fertility and women's employment are influenced by a set of economic, social, and cultural factors illuminated by complementary theories.

### **1.1.2 Economic Analysis of Fertility and Women's Employment**

#### **1.1.2.1 Beckerian Theories: "Quality-Quantity" and Opportunity Cost**

The economic analysis of fertility proposed by Gary Becker in the 1960s represents a pioneering approach that applies economic principles to family behavior. His theory views the family as a rational production unit seeking to optimize its resources, applying classical economic concepts such as utility, opportunity costs, and resource allocation to decisions traditionally considered part of the private sphere.

At the core of this theory is the fundamental distinction between the "quantity" of children (their number) and their "quality" (the investment made per child in terms of education, health, and cultural activities). These two dimensions are interdependent; as family resources—whether financial or temporal—are limited, an increase in one necessitates a reduction in the other. In

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decisions regarding their sexuality and reproduction based on their emotions rather than rational reflection, thereby questioning their ability to make informed choices about their bodies and reproductive health, to the detriment of their autonomy.

this context, Becker identifies several types of costs associated with children: direct costs related to material expenses, indirect costs in terms of parental time, opportunity costs representing foregone income, and psychological costs including stress and increased responsibilities.

Moreover, Becker's theory clearly illustrates the tendency of more educated women to have fewer children. Indeed, their opportunity cost is higher due to potentially higher wages; they invest more in the "quality" of each child, benefit from better access to information and contraception, and often have more developed professional aspirations. Time thus plays a crucial role in this analysis: as a non-transferable and limited resource, its value increases with the level of education and must be allocated between paid work, childcare, and leisure, knowing that childcare is particularly time-consuming and difficult to fully delegate.

This theoretical approach also helps explain several phenomena observed in the labor market, such as the negative correlation between female labor force participation rates and fertility rates, career interruptions related to motherhood, wage differences between men and women, and the concentration of women in certain sectors that are more compatible with family life. Furthermore, it aids in understanding the major demographic transformations observed in developed societies: declining fertility rates, increased investment per child, postponement of births, and the growing importance of work-family reconciliation policies.

However, Becker's theories have also faced criticism. Some research suggests that fertility decisions are not based solely on economic considerations but are also influenced by cultural, social, and political factors. For example, Richard Easterlin's relative income theory (1974) challenges the idea that reproductive choices are determined solely by cost-benefit calculations. He introduced the concept of "relative income," which suggests that reproductive decisions are influenced by individuals' material aspirations relative to their financial situation. According to him, if couples cannot achieve the lifestyle they desire based on their resources, this may reduce their fertility. This theory highlights that decisions about having children are not only based on economic calculations but also on social perceptions and cultural expectations.

Nancy Folbre (1983) critiques Becker's individualistic rationality by emphasizing that family decisions are not solely based on rational economic calculations but are influenced by social norms, power inequalities between genders, and altruistic obligations. Amartya Sen (1990) challenges Becker's idea that individual preferences are stable and exogenous, arguing instead that preferences can be endogenous and shaped by factors such as education, life experiences, and public policies.

Additionally, Bergmann (1995) rejects Becker's notion that women's choices regarding work and family are optimizations based on human capital. She highlights structural constraints, including discrimination in the labor market and the lack of policies promoting gender equality. Lundberg and Pollak (1996) argue that Becker's theory fails to account for intra-family negotiations and the influence of gender norms on decisions related to fertility and employment. They propose an alternative model based on game theory. Finally, Goldin and Katz (2002) demonstrate that women's opportunity costs are not uniform and are affected by factors such as education, public policies (e.g., parental leave, childcare), and changes in market structures. They emphasize that Becker underestimates the impact of institutional contexts on women's choices.

Although this theory has been criticized for its sometimes overly mechanistic view of family choices, it remains a powerful analytical framework for understanding the interactions between professional and family decisions. It sheds light on the economic constraints influencing reproductive choices and contributes to the design of more effective public policies that take into account the complexities of the trade-offs faced by modern families.

#### **1.1.2.2 Human Capital Theory: Education, Employment, and Fertility**

The human capital theory, developed in the 1960s by economists such as Gary Becker and Theodore Schultz, serves as a fundamental analytical framework in economics for understanding the interactions between education, employment, and reproductive choices. This theoretical approach posits that the relationship between fertility and women's employment is profoundly influenced by the accumulation of skills and professional experience, creating a complex dynamic in life choices. The core element of this theory lies in the idea that investments in education and training enhance individuals' productivity, significantly influencing their labor market participation and their decisions regarding reproduction. Consequently, as women invest in their human capital through education and career development, the opportunity costs associated with motherhood increase, creating a complex interaction between professional and reproductive choices.

From a macroeconomic perspective, the accumulation of human capital is recognized as an essential driver of economic growth. Research by Stephanie Fraisse-D'Olimpio (2009) and Traoré Souaïbou Samba Lamine et al. (2021) demonstrates that countries investing in the education and training of their populations generally experience increased productivity and better social integration. In this light, public policies that support education and facilitate



women's access to professional opportunities can yield benefits at both individual and collective levels.

However, this theory is not without its critiques. As Anass Saidi (2021) points out, the human capital approach sometimes tends to oversimplify the complex relationships between education, employment, and fertility. It particularly overlooks the importance of social and structural factors such as cultural norms, family policies, and local economic conditions. A debate also persists regarding the predominance of human capital as an explanatory factor compared to other contextual influences.

### **1.1.2.3. Discrimination in the Labor Market: Theories and Impact on Women's Employment and Fertility**

In contemporary society, discrimination in the labor market is a complex phenomenon that particularly affects women, influencing their professional and reproductive choices. Economic theories have developed several analytical frameworks to understand these discriminatory mechanisms and their implications.

First, aversion models, initially developed by Gary Becker, analyze how employer biases influence their hiring and wage decisions. Employers who exhibit aversion towards certain groups are willing to incur additional economic costs to avoid hiring members of those groups. According to Emmanuel Duguet (2010) and Nathalie Havet et al. (2002), this discrimination results in lower wages for equivalent work, reduced hiring opportunities, a negative impact on investment decisions in human capital, and an increased unemployment rate for discriminated groups. Consequently, women, anticipating these discriminations, may alter their training and career choices, creating a vicious cycle that reinforces existing inequalities.

Next, statistical discrimination, as analyzed by Emmanuel Duguet (2010) and Clémence Berson (2011), focuses on the use of stereotypes in assessing potential productivity. This theory highlights the reliance on average group characteristics to evaluate individuals, assumptions about women's reduced availability due to family responsibilities, biases regarding the professional commitment of mothers, and reluctance to invest in women's training. These practices create invisible yet real barriers to women's professional advancement, particularly for those of childbearing age or with children.

Moreover, matching models and asymmetric information, according to the work of Nathalie Havet and Catherine Sofer (2002), as well as Drissi Meryem and Skalli Leila (2023), reveal how imperfect information in the labor market contributes to occupational segregation. These models identify gendered professional networks that limit access to certain opportunities, the



persistence of biases despite equivalent qualifications, self-reinforcing underrepresentation of women in specific sectors, and increased difficulties for women in signaling their actual skills. Ultimately, these various theories emphasize how forms of discrimination interact and mutually reinforce each other, creating structural barriers to professional equality. For women, these discriminations influence not only their career opportunities but also their fertility choices, leading them to postpone or limit their motherhood plans to minimize the impact on their professional trajectories. Therefore, understanding these mechanisms is essential for developing effective policies aimed at reducing discrimination and promoting equal opportunities in the labor market. Such policies must simultaneously address multiple levers: legislative, cultural, and organizational—to create a more equitable professional environment.

## **1.2 General Analytical Framework**

These approaches revolve around four fundamental axes that shape maternity decisions:

### **1.2.1 Time and Budget Constraints in Household Fertility Choices**

Time and budget constraints play a fundamental role in modern family planning, creating a complex balance for couples considering having children. Indeed, in terms of time, reconciling professional life and family planning represents a major challenge. Women, in particular, face difficult decisions regarding the optimal time to become mothers, especially since the period of professional stabilization can extend over several years after studies, naturally pushing back the age of first pregnancy. Moreover, fear of career repercussions is also prevalent: interruptions in career path, slower career progression, and even potential discrimination related to maternity. Furthermore, the persistence of unequal distribution of domestic and family tasks, analyzed in the theory of double burden, reinforces women's difficulties. This theory highlights that women bear a double day, combining paid work and domestic responsibilities. Consequently, this situation intensifies the time constraints weighing on working mothers and directly influences their choices between fertility and family organization.

Additionally, the financial aspect constitutes another determining factor in family decisions. Becker's theory provides a relevant approach to the direct and indirect costs of children. According to this theory, parents make a trade-off between "quantity" (number of children) and "quality" (investment per child). With increasing income and education levels, families tend to prioritize quality, investing more in each child's education, health, and leisure activities, which tends to reduce family size. Recent studies confirm this theory. According to Mance and Brandrup (2010), healthcare expenses increase significantly with the arrival of the first child, as do clothing and meal costs. Although childcare costs may decrease for large families, the

overall financial burden remains high due to cumulative costs. Spitzer et al. (2021) emphasize that the arrival of a child leads to a decrease in perceived economic well-being, particularly in high-income regions.

Beyond direct costs, indirect financial impacts are also significant. Indeed, Pernia (2010) emphasizes that maternity or parental leave periods lead to a temporary decrease in income. Similarly, career progression and, consequently, salary can be affected, with long-term repercussions on retirement benefits. Moreover, family expansion requires more spacious housing, and expenses related to vacations and leisure activities increase proportionally.

These constraints create a complex cycle: waiting for sufficient financial stability pushes back the age of first pregnancy, which can then biologically limit the possible number of children. This reality partly explains the gap observed between the average number of children desired by French people (about 2.3) and the actual number of children per woman (1.84 in 2023) (see INSEE and UNAF report). The double burden, by associating time pressures and structural inequalities, well illustrates how practical constraints can significantly influence family life choices, despite personal aspirations. Fortunately, various support mechanisms exist in France to support families. Family allowances, paid from the second child onwards, the Early Childhood Reception Benefit (PAJE), tax credit for childcare expenses, and paid parental leave (PreParE) constitute significant financial support.

### **1.2.2 The Opportunity Costs of Motherhood**

Opportunity cost refers to the benefits individuals give up when choosing one option over another. In the context of motherhood, this concept is particularly illuminating. Indeed, the choice to have a child entails significant professional sacrifices, such as loss of income during parental leave. This dynamic is well explained by Beckerian theories, which analyze fertility from an economic perspective. According to these works, maternity decisions follow a rational logic where women evaluate the opportunity cost associated with interrupting or slowing down their career, as well as other aspects of their personal life.

However, these informed choices face difficult economic realities, as shown by empirical studies. For example, Villanueva and Lin, 2020 indicate that mothers earn significantly less than their childless peers, with a 13% wage reduction observed in Latin America, reaching 21% for mothers with young children. Moreover, the opportunity cost increases by 1.2% for each child. In another context, Almond and Machado, 2023 show that women bear higher opportunity costs than men, with estimates suggesting that the cost of two children represents 28-29% of a woman's total income. In Sweden, an average reduction of 5% in their annual

income is observed for each child, with much higher penalties in the United States (15-20% for two children).

These wage penalties are partly explained by employers' perception that mothers are less committed to their work. Faced with these discriminations, many qualified women turn to entrepreneurship. This option thus becomes a strategy to reduce the opportunity costs associated with motherhood, although it may intensify conflicts between work and family life.

### **1.2.3 Motherhood and Labor Market Behaviors**

Motherhood also modifies women's behaviors in the labor market regarding job search. Mothers prioritize jobs offering flexible schedules or specific benefits, which can negatively influence their hourly wages. This choice is motivated by increased opportunity costs related to simultaneously managing family and professional responsibilities. As highlighted by Budig and England (2020), mothers experience a notable "motherhood penalty" on their wage income, particularly due to their choice of less demanding jobs in terms of working hours or location. Furthermore, Matysiak and Vignoli (2022) emphasize the importance of flexible working conditions and parental leave in maintaining mothers in the labor market, while noting that these options are not always accessible in developing countries. In the Arab context, Assaad, Krafft, and Keo (2023) show that traditional gender norms exacerbate the challenges mothers face in maintaining work-life balance.

In Morocco, the High Commission for Planning report (2023) illustrates these dynamics by highlighting that Moroccan mothers frequently reduce their activity rates or leave the labor market due to the lack of affordable childcare services and insufficient support for working families. More globally, Adema and Clarke (2021) emphasize that the absence of adapted public policies, such as accessible childcare facilities or paid parental leave, contributes to hindering mothers' integration into the labor market.

Finally, the impact of education on fertility choices adds another dimension to this analysis. Human capital theory considers education as an investment aimed at increasing productivity and future income. However, this investment, often incompatible with short-term parental responsibilities, increases the opportunity cost of motherhood for women in training or early career. Studies conducted in England and Wales confirm that women with high levels of education significantly delay motherhood due to their academic and professional commitments. These decisions influenced by economic and social considerations are particularly pronounced among women investing more in lengthy and costly education.

#### **1.2.4 Individual Preferences**

Individual preferences regarding fertility are influenced by a complex combination of personal and sociocultural factors. This diversity of choices is studied through several complementary theoretical frameworks, notably Becker's economic theory and Parsons' social role theory.

In this sense, Becker's economic theory offers a relevant analytical framework for understanding how personal values influence fertility decisions. According to this approach, individuals make rational choices by evaluating the costs and benefits associated with parenthood. Women in demanding careers face particularly complex choices. An American study shows that 77% of female physician's delay motherhood for professional reasons (Andrea N et al, 2021). These delays often come with increased risks of infertility and the need for assisted reproductive technologies. Investment in education and career increases the opportunity cost of motherhood. This phenomenon explains the postponement of first pregnancy among highly qualified women, particularly in professions requiring continuous training.

In parallel, Parsons' social role theory complements this analysis by examining how cultural norms shape reproductive behaviors. In traditional societies, gender roles strongly influence reproductive choices, often creating pressure toward early parenthood. Cultural norms frequently define the "ideal" age to become a parent, thus influencing individual decisions. European studies show marked differences between countries: Nordic countries, characterized by greater gender equality, show better work-family balance, while Mediterranean countries, with more traditional gender roles, show greater constraints on reproductive choices (Sciences Po, "Parenthood in Europe: Sequential Analysis of Pathways to Adulthood," European Social Survey). These differences are reflected in fertility rates and average age at first birth.

Thus, the emergence of new family models also influences individual preferences. The growing emphasis on personal fulfillment modifies traditional trade-offs, while public policies can facilitate or hinder the reconciliation of different aspirations. Recent research emphasizes the importance of analyzing the interaction between individual preferences and structural constraints. Parenting support mechanisms, such as access to childcare services and paid parental leave, significantly influence individual choices.

The labor market also plays a crucial role in these dynamics. Professional flexibility becomes a major criterion in career choices, while discrimination related to motherhood continues to influence individual strategies. The increasing access to remote work is changing the

possibilities for balancing professional and family life, offering new perspectives for managing these different responsibilities.

### **1.2.5 The Institutional and Social Context**

The institutional and social context includes public policies, parenting laws, and societal attitudes toward women who work while raising children. These dimensions can be analyzed through several key theories and supported by empirical studies:

First, parental leave policies play a crucial role in balancing career and parenthood. Human capital theory suggests that these policies influence parental decisions by reducing opportunity costs related to career interruption. Extended and well-paid leave can thus compensate for temporary income losses and allow women to maintain their professional trajectory after motherhood. A comparative study conducted in Scandinavian countries demonstrates that the individualization of parental leave, particularly through quotas reserved for fathers, significantly contributes to reducing gender inequalities (Mathews, 2022). In Sweden, the introduction of these quotas in 1995 led to a notable increase in leave-taking by fathers, with measurable positive effects on gender equality and women's professional involvement (Rostgaard, 2002; Lammi-Taskula, 2006).

Second, social support, particularly access to childcare services, constitutes a determining factor in parental decisions. Gary Becker's economic theories on family offer a relevant analytical framework for understanding how these supports reduce the direct and indirect costs of raising children, thus facilitating the reconciliation between motherhood and professional career. For example, in France, mechanisms like the Early Childhood Care Benefit (PAJE) and the tax credit for childcare expenses significantly lighten parents' financial burdens. These mechanisms align with the dual burden theory developed by Danièle Kergoat, demonstrating how public policies can effectively reduce the pressure of family responsibilities on women's careers.

Third, societal attitudes toward working mothers exert a major influence on their professional and family choices. The social role theory developed by Talcott Parsons (1955) illuminates how cultural norms influence expectations of women. In societies valuing gender equality, these norms can encourage a better balance between career and family, while more traditional attitudes can limit women's professional opportunities. A comparative analysis between France and Spain highlights the significant impact of cultural norms on fathers' use of parental leave. Recent data shows that in France, despite favorable policies, societal norms continue to influence paternal engagement: only 30% of fathers take their full paternity leave, thus perpetuating inequalities in the distribution of parental responsibilities.

## **2. Main Empirical Models of Fertility Decisions and Women's Work**

The study of decisions relating to fertility and women's employment is based on various empirical models that seek to understand the complex interactions between these two dimensions. These models, drawing on structural approaches and quantitative analyses, evaluate how women's choices regarding work and motherhood are correlated and influenced by economic, social, and personal factors.

### **2.1 Moffitt's Dynamic Model (1984)**

The dynamic model proposed by Moffitt (1984) represents a major theoretical framework for analyzing the relationship between fertility and employment. Its fundamental concept is based on the interdependence between these two dimensions, emphasizing that decisions regarding fertility and work are not made in isolation. According to this model, women's increasing involvement in the labor market directly influences their fertility choices, which evolve based on career-related opportunity costs and personal preferences (Julie Moschion, 2009; Cédric Doliger, 2008).

This pioneering approach fits within a broader perspective of the economic theory of household behavior, initiated notably by Gary Becker (1981), which considers the family as a unit of production and consumption making rational decisions. However, Moffitt's model stands out for its dynamic dimension and its particular attention to the temporal effects of fertility choices on professional careers. Using panel data from the National Survey of American Young Women, Moffitt employs an intertemporal optimization model to evaluate these dynamics. This methodology allows for capturing not only the immediate effects but also the long-term implications of fertility decisions on career trajectory. The originality of his approach thus lies in the introduction of sophisticated control variables that allow for isolating the specific effect of fertility choices from other socio-economic determinants.

Its results provide three major contributions to the understanding of this relationship. First, it demonstrates an inverse relationship between income and fertility: an increase in women's income leads to a decrease in their fertility while promoting an increase in their professional activity. This observation can be explained by the rising opportunity cost of time spent on children as potential wages increase. Second, it identifies lasting impacts on career trajectories, notably a permanent decrease in wages following childbirth. This phenomenon, referred to as the "motherhood penalty," can be explained by several factors: the depreciation of human capital during periods of interruption, reduced investment in continuing education, and potentially discriminatory practices in the labor market. Finally, it highlights temporary post-



birth effects, such as a temporary reduction in professional activity levels, although these effects tend to diminish over time. This observation suggests the existence of adaptation mechanisms that allow women to gradually reconcile family and professional life.

These results also reveal important implications for public policy. They suggest that measures aimed at facilitating the reconciliation of family and professional life could mitigate the negative effects of motherhood on women's careers. Initiatives such as paid parental leave, accessible childcare services, and flexible working arrangements appear to be potential levers for reducing the motherhood penalty. Furthermore, subsequent research has largely confirmed and enriched these initial observations. More recent studies (Del Boca et al., 2009; Adda et al., 2017) have notably highlighted the importance of social norms and institutional arrangements in modulating these effects across different countries and cultural contexts. Ultimately, Moffitt's model remains an essential reference for understanding the complex interactions between fertility and employment. Its relevance continues to be demonstrated by numerous empirical studies that draw on it while enriching it with new dimensions of analysis.

## **2.2 The Stochastic Model of Francesconi (2002)**

Francesconi (2002) develops an innovative stochastic model that enhances the understanding of the relationship between fertility and employment by introducing a crucial distinction between full-time and part-time work. His approach is based on a finite-horizon dynamic optimization model with discrete choices in an uncertain context. The originality of his method lies in the use of longitudinal American data covering an extensive period from 1968 to 1991, allowing for an in-depth analysis of women's career trajectories.

The results of his analysis highlight several fundamental dynamics. On one hand, he observes a strong persistence in full-time employment, with an 85% probability of remaining in this status from one period to the next. This stability is primarily explained by the significant returns on full-time experience for salary trajectories. On the other hand, persistence in part-time employment is lower, with a retention probability of 58%, reflecting more limited salary progression prospects in this type of employment. Additionally, a major finding of his analysis concerns the relationship between earning potential and fertility preferences. Women with high income potential generally exhibit a lower marginal utility for children, thus prioritizing their professional careers. Conversely, those with a strong preference for motherhood tend to have more modest income profiles, revealing a form of trade-off between career and family.

Moreover, Francesconi observes low substitutability between full-time and part-time employment. Contrary to some common assumptions, part-time work does not serve as an



effective transition to full-time employment after a maternity-related period of inactivity. Thus, this study highlights the limitations of part-time work as a strategy for balancing family and professional life. Consequently, these results have important implications for public policies aimed at facilitating the reconciliation of career and motherhood, suggesting that more targeted measures may be necessary to support the professional trajectories of mothers beyond merely promoting part-time work.

### **2.3 Complementary Models**

Complementary approaches include microsimulation models (Creedy & Duncan, 2002; Immervoll et O'Donoghue, 2001) as well as structural models based on game theory (Browning et al., 2014; Goussé et al., 2017). These models allow for the exploration of the complex interactions between public policies and individual behaviors regarding employment and fertility.

#### **2.3.1 Microsimulation Models**

Microsimulation models are an essential analytical tool for evaluating the impact of public policies. These models use detailed individual data to simulate how different measures affect household behaviors and choices. They allow for the analysis of the effects of various policies such as family allowances, tax credits, childcare assistance, and paid parental leave.

One of the strengths of these models is their ability to integrate household budget constraints along with their sociodemographic characteristics. By simulating the impact of taxation and social transfers on individual choices, they provide valuable insights into the potential effects on family behaviors. This quantitative approach enables policymakers to anticipate the consequences of their decisions and adjust measures accordingly. These models are particularly useful for estimating behavioral changes in response to policies. For example, they can predict how a change in family allowances might influence childcare decisions or how a new tax credit could affect parents' employment rates.

Regarding the relationship between fertility and women's employment, these models allow for the assessment of several crucial aspects. They analyze the impact of family policies on fertility decisions, demonstrating that supportive measures can encourage births by reducing the costs associated with raising children. The models also study how work-family reconciliation measures, such as access to childcare services, can facilitate women's employment while supporting fertility.

Furthermore, these models examine the influence of child-related costs on women's professional activity, showing how expenses related to education and childcare can affect career

choices. They also highlight the trade-offs between career and motherhood, illustrating how public policies can mitigate these compromises, particularly through guarantees of job return after parental leave. This analytical approach thus provides a solid foundation for understanding the complex interaction between family policies, fertility choices, and women's employment.

### **2.3.2 Structural Models**

Structural models based on game theory provide a powerful analytical framework for understanding the complex interactions in the labor market and family decisions. These models examine the strategic relationships between women, their employers, and the state, allowing for an analysis of how each actor adjusts their behavior based on the actions of others.

In this context, employers adjust their human resources policies in response to regulations on parental leave and other family support measures. These adjustments may include changes in recruitment practices, promotion criteria, and work organization. In light of these employer reactions, women reassess and adapt their career strategies as well as their maternity decisions. The state also plays a crucial role in this system of interactions. Through its public policies, it influences the behaviors of businesses and employees. Incentive measures for companies, labor regulations, and financial compensations create an environment that shapes women's professional and family choices.

This analytical approach highlights the subtle mechanisms by which family policies affect the decisions of various actors. It helps to understand how employers' adaptation strategies can either reinforce or undermine the effectiveness of public policies aimed at reconciling professional and family life.

Structural models also reveal the importance of expectations in women's career choices. Women consider not only current policies but also the likely reactions of their employers, which influences their decisions regarding the timing of motherhood and their professional advancement.

### **2.4 The Intertemporal Choice Model of Fisher**

The intertemporal choice model, formalized by Irving Fisher in his book "The Theory of Interest" in 1930, provides a powerful conceptual framework for analyzing how individuals allocate their resources, particularly their time, across different periods of their lives. When applied to women's decisions regarding work and family, this model highlights the complex trade-offs between professional opportunities, family responsibilities, and personal preferences. This model is based on the assumption that women, like any individual, seek to maximize their long-term utility. This optimization requires strategic choices regarding employment and

motherhood while considering the associated opportunity costs. Thus, reducing or temporarily interrupting professional activity to raise children can lead not only to immediate income losses but also to lasting effects such as slowed salary progression or skill obsolescence. Salary variations also influence these trade-offs: periods of high wages or advancement opportunities may encourage delaying motherhood to capitalize on these gains, while phases of low economic growth or job uncertainty may shift focus toward family goals.

Moreover, the model underscores the importance of public policies and institutional factors. Generous and flexible parental leave policies can reduce the opportunity costs associated with motherhood by enabling women to reintegrate into the labor market more easily after a period of absence. Similarly, access to quality childcare services plays a crucial role in facilitating the reconciliation of family and professional responsibilities. Additionally, family planning—made possible by better education and increased access to contraception—allows women to align their maternity decisions with their professional and personal aspirations.

Finally, this model emphasizes that women's individual preferences, influenced by their education, cultural values, and socioeconomic status, impact their intertemporal choices. Some prioritize their careers by delaying motherhood, while others opt for a more balanced distribution between work and family.

## **2.5 Job Search Models**

Job search models, initially developed by economists Peter Diamond, Dale Mortensen, and Christopher Pissarides in the 1970s and 1980s, are essential analytical tools for examining the dynamics between the labor market and periods of inactivity, particularly those related to maternity.

Their work, which earned them the Nobel Prize in Economics in 2010, sheds light on frictions in the labor market by studying job search processes and adjustments between employers and job seekers. These models incorporate several key elements: they consider the time and resources individuals invest in finding a job, as well as the costs associated with transitioning from inactivity to employment. They also take into account the availability of job openings and labor market conditions that influence women's choices between staying at home or returning to work. Women's personal preferences, related to their roles within the family and in the labor market, play a central role in their decisions, often influenced by factors such as family support, parental leave policies, and cultural values.

These models are particularly relevant for analyzing how women juggle their family responsibilities and professional aspirations. For instance, women face specific challenges

when seeking to reintegrate into the labor market after maternity leave. The analysis helps understand how these transitions are influenced by job search costs and available opportunities. Additionally, it provides a framework for evaluating the effectiveness of policies supporting maternity and return-to-work initiatives in facilitating women's professional reintegration.

## **2.6 Other Explanatory Models of the Relationship Between Fertility and Women's Employment**

Recent approaches developed by Doepke et al. (2019), Bick, Fuchs-Schündeln, and Lagakos (2018), Adda, Dustmann, and Stevens (2017), as well as Guner, Kaya, and Sánchez-Marcos (2020), provide complementary insights into the relationship between fertility and women's employment. On one hand, Doepke et al. (2019) analyze the influence of public policies (such as childcare services and parental leave) on the trade-offs between motherhood and career, demonstrating that appropriate measures can mitigate negative impacts on employment. On the other hand, behavioral and rational choice models (Bick et al., 2018) incorporate individual preferences into the analysis of work-motherhood decisions, highlighting the facilitative role of part-time work.

Furthermore, life cycle models with economic uncertainty (Adda et al., 2017) examine how economic risks (such as unemployment and wage fluctuations) influence the decision to delay or adopt motherhood, shedding light on the trade-offs between financial security and family plans. Additionally, general equilibrium models with public interventions (Guner et al., 2020) show that childcare subsidies and tax incentives simultaneously promote female employment and fertility, particularly among less-educated women.

Overall, these different empirical approaches illustrate the complexity of fertility and employment choices, influenced by economic, social, and institutional factors. The evolution of these models allows for a more nuanced understanding of the trade-offs between career and motherhood, thus providing a solid foundation for developing tailored support measures for women's professional and family choices.

## **3. Theoretical Synthesis: Variable Analysis and Conceptual Model**

### **3.1 Comparative Analysis of Theories on Fertility and Women's Employment: Variables and Relationships**

The complex relationship between fertility and women's employment has been analyzed through various theoretical lenses, each highlighting specific factors and interactions. These theories, ranging from economic frameworks to sociological perspectives, share several

common variables such as opportunity costs, social norms, and institutional policies. By examining these variables and their relationships, it becomes possible to understand the dynamics between professional aspirations and family choices, and how they are influenced by economic, cultural, and policy contexts. The following table provides a comparative analysis of these theories, highlighting their strengths, limitations, common variables, and the interactions between them.

**Figure N°1: Conceptual Framework: Interactions Between Fertility, Women's Employment, and Influencing Factors**

Theory	Main Idea	Applications/Strengths	Common Variables	Relationships Between Variables	Limitations
<b>Becker's Model (1960)</b>	Economic analysis: opportunity cost, quality vs. quantity of children	Explains the decline in fertility linked to education and income.	Opportunity cost, income, number of children, child quality	Higher income → Higher opportunity cost → Lower fertility.	Ignores social and cultural factors; overly simplistic economic perspective.
<b>Social Roles (Parsons, 1955)</b>	Gender norms dictate family and professional choices	Highlights how social expectations influence fertility and employment.	Social norms, gender roles, employment participation, family roles	Traditional norms → Limited employment for women → Higher fertility.	Too rigid for modern societies moving toward gender equality.
<b>Double Burden (Kergoat, 1970)</b>	Tensions between domestic and professional responsibilities for women	Emphasizes invisible obstacles due to mental and domestic workload.	Domestic workload, mental burden, employment participation	Increased domestic workload → Decreased employment participation → Lower fertility if stress is high.	Lacks quantitative tools to measure these impacts.

<b>Dynamic Models (Moffitt, 1984)</b>	Intertemporal impact of family decisions on careers and income	Provides an in-depth analysis of motherhood penalties (wage loss, impacted career trajectories).	Career interruptions, wage penalties, long-term employment effects	Motherhood → Career interruptions → Lower wages and slower career progression → Negative fertility-	Analytical complexity; requires longitudinal data.
<b>Stochastic Model (Francesconi, 2002)</b>	Distinction between full-time and part-time work	Illustrates employment-motherhood transitions and limits of part-time work for work-life balance.	Employment type (full/part-time), income potential, preferences	High income potential → Preference for full-time work → Lower fertility; Preference for part-time work → Higher fertility.	Limited by specific national contexts; less generalizable to emerging economies.
<b>Institutional Theory</b>	Role of public policies in reconciling work and family life	Highlights the importance of parental leave, childcare services, and tax incentives.	Parental leave, childcare access, financial incentives	Supportive policies → Lower opportunity cost → Positive fertility-employment relationship.	Dependent on cultural and political contexts; effectiveness varies across mechanisms.

<b>Microsimulation (Creedy &amp; Duncan, 2002)</b>	Models to evaluate the impact of public policies on employment and fertility	Accurate predictions of policy effects (allowances, leave, subsidies).	Policy variables (e.g., tax credits, childcare costs), individual behaviors	Tax credits → Increased employment and fertility; High childcare costs → Reduced employment and fertility.	Depends on initial assumptions and available data.
<b>Individual Preferences Theory</b>	Rational choices influenced by personal aspirations and social norms	Explains differentiated choices based on individual and professional contexts.	Personal preferences, social norms, career aspirations	Strong career aspirations → Postponed motherhood → Lower fertility; Supportive norms → Positive fertility-employment link.	Sometimes underestimates structural constraints (discrimination, cultural pressures).
<b>Behavioral Theories</b>	Influence of social norms on motherhood and employment	Sheds light on gender biases and adaptation strategies in response to discrimination.	Gender norms, societal expectations, employment behaviors	Traditional norms → Negative fertility-employment relationship; Egalitarian norms → Positive fertility-employment link.	Requires strong empirical frameworks to validate theoretical behaviors.

Source: Developed by the authors



### **3.2 The Impact of Economic, Social, and Institutional Variables on Women's Fertility and Employment Decisions: A Comprehensive Analysis**

The relationship between economic, social, and institutional variables plays a crucial role in the dynamics between fertility and women's employment. These variables articulate and interact in complex ways, creating a system where each element influences the others.

Economic variables constitute the first pillar of this analysis. Opportunity cost represents a determining factor: the more qualified women are and the higher their potential income, the more significant the impact of motherhood can be on their career. According to Becker's theory, more educated women tend to prioritize "quality" over "quantity" in their fertility choices. Costs, both direct (education, health) and indirect (loss of income), significantly influence fertility decisions.

Social variables, particularly gender norms, also play a fundamental role. In traditional societies, cultural expectations may push women to prioritize motherhood over their professional careers. Parsons' and Kergoat's theories emphasize the importance of these social expectations in individual choices. Father involvement, particularly visible in Nordic countries, can facilitate the reconciliation between career and motherhood.

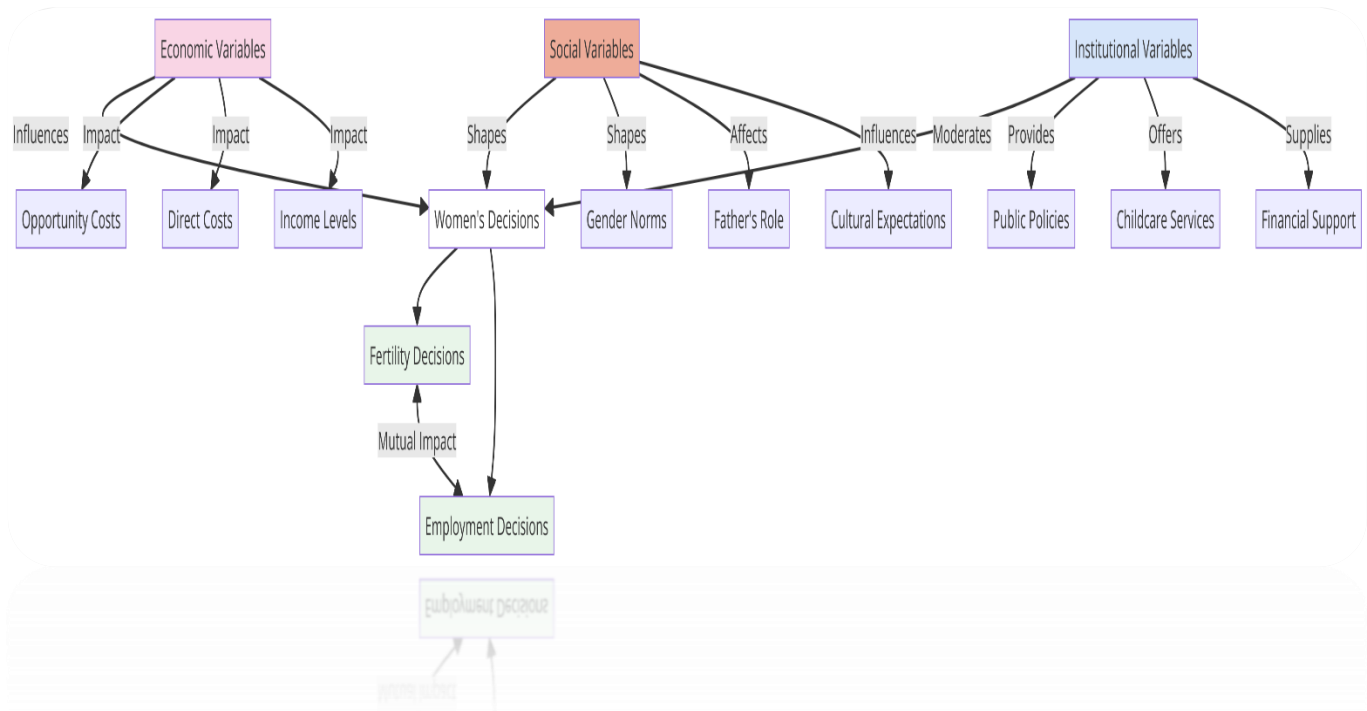
Institutional variables act as essential levers. Public policies, such as parental leave and childcare services, can significantly reduce opportunity costs. Sweden's example illustrates how well-designed policies can maintain both a satisfactory birth rate and high female participation in the labor market. Financial support, such as family allowances, helps make fertility more accessible.

The interaction between these three types of variables creates a dynamic system where economic factors are modulated by the social context and can be influenced by institutional policies. This comprehensive understanding is essential for designing effective public policies that facilitate the reconciliation between professional and family life.

The figure above illustrates how the three main categories of variables (economic, social, and institutional) influence women's decisions regarding fertility and employment. It also shows:

- The sub-components of each type of variable
- The direct relationships between variables and decisions
- The bidirectional interaction between fertility and employment decisions
- How institutional variables moderate the impact of economic and social variables

**Figure 2: Women's Fertility and Employment Decision Variables**



**Source: Developed by the authors**

This diagram visually complements the textual analysis by clearly showing the interconnections between the different factors that influence women's choices.

### 3.3 Conceptual Model: Fertility, Women's Employment, and Influencing Factors

The proposed conceptual model for this article examines the complex interactions between economic, social, and institutional factors that influence women's decisions regarding employment and fertility. This model is based on three main dimensions :

#### ✓ Economic Factors

- **Opportunity Costs:** The potential loss of income when women choose to dedicate themselves to motherhood instead of pursuing a career.
- **Income Levels:** The impact of household income on decisions related to family size and professional choices.
- **Child-Rearing Costs:** Both direct costs (such as childcare fees) and indirect costs (such as time spent on education) associated with raising children.

#### ✓ Social Factors

- **Gender Norms:** Societal expectations regarding women's roles as mothers and professionals.
- **Family Roles:** How responsibilities are distributed between partners within the family unit.

- **Cultural Expectations:** Cultural influences that shape women's decisions regarding motherhood and employment.
- ✓ **Institutional Factors**
- **Public Policies:** Laws and regulations related to parental leave, childcare services, and tax incentives that support families.
- **Resource Availability:** Access to affordable and quality childcare services.
- **Financial Support Systems:** Financial assistance available for families.
- ✓ **Interactions and Mediating Effects**

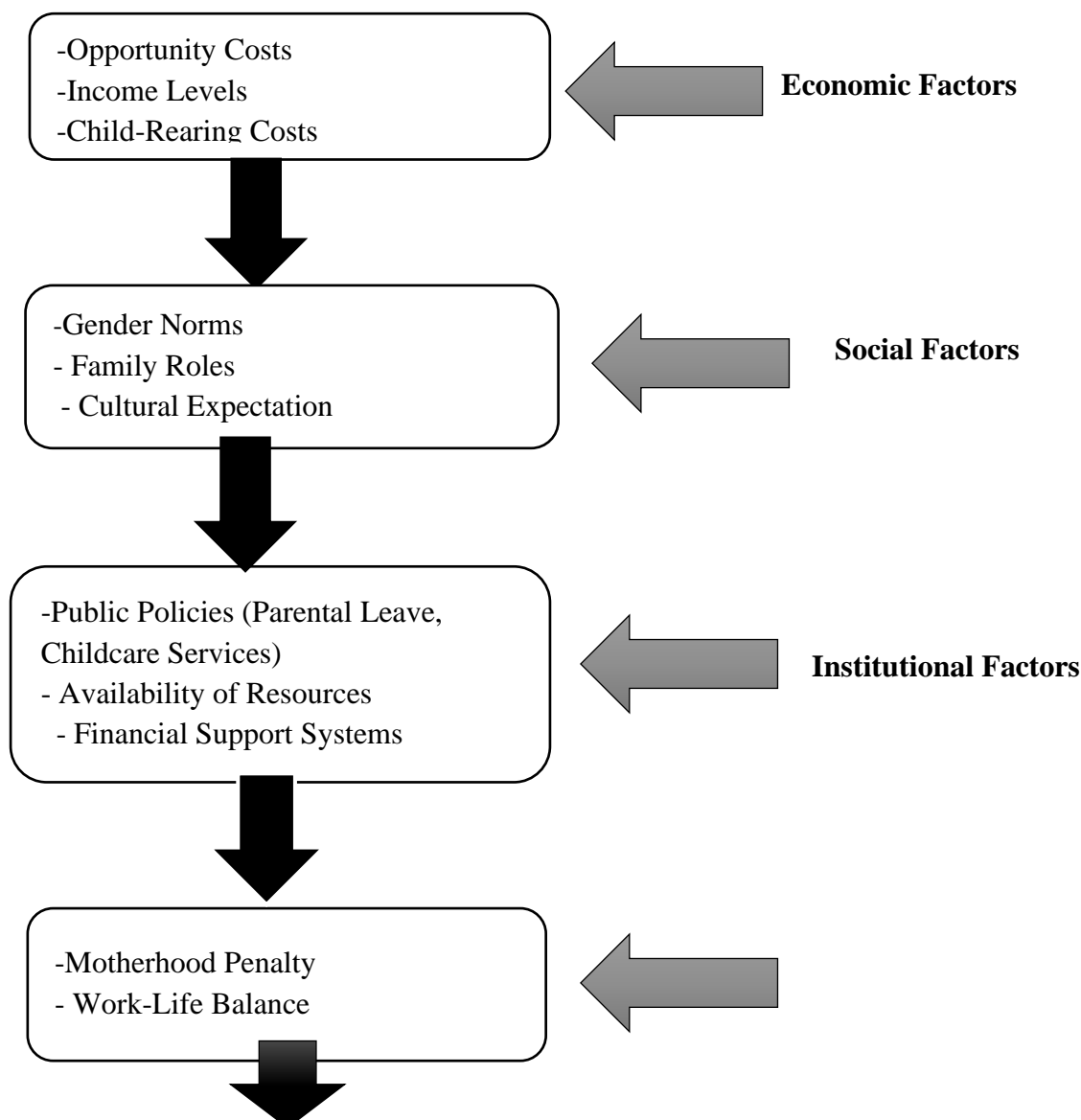
The interactions among these dimensions create mediating effects such as:

- **Motherhood Penalty:** Career interruptions and salary reductions that women experience when they become mothers.
- **Work-Life Balance:** Women's ability to reconcile their professional and family responsibilities, influenced by institutional support.
- ✓ **Outcomes**

The dependent outcomes of the model include:

- **Fertility Outcomes:** The number of children and the timing of births.
- **Employment Outcomes:** Labor market participation, type of employment (full-time or part-time), and career progression.

**Figure 3: Conceptual Model of the Interactions Between Economic Social and Institutional Factors Influencing Women's Employment and Fertility Outcomes**



<b>Fertility Outcomes</b>	<b>Employment Outcomes</b>
-Number of Children - Timing of Births	- Labor Force Participation - Employment Type (Full/Part) - Career Progression

**Source: Developed by the authors**

## **Conclusion**

The relationship between fertility and women's employment is a subject of fascinating complexity, where economic, social, cultural, and institutional dynamics intersect. The models studied reveal that this relationship is far from linear and uniform. It constantly evolves based on historical contexts, social transformations, and implemented public policies, creating a dynamic and multidimensional landscape.

Classical economic approaches, particularly human capital theory and Beckerian models, provide crucial insights into the rational mechanisms underlying individual choices. These theories demonstrate how investment in education and career influences women's fertility decisions. They highlight a particularly interesting phenomenon: the increasing trend among women to prioritize "quality" over "quantity" in their motherhood choices, notably by investing more resources in the education and well-being of a smaller number of children. This paradigm shift often accompanies complex trade-offs between professional aspirations and family plans. Sociological and cultural theories significantly enrich this analysis by reminding us that women's choices are situated within specific social contexts. Social role theory and the double burden theory are particularly enlightening. They demonstrate how gender norms and patriarchal structures continue to profoundly influence women's choices, sometimes creating tensions between their personal aspirations and societal expectations. These approaches emphasize the importance of considering the structural and cultural constraints that shape individual decisions.

More recent models offer a particularly relevant integrative perspective. They show how public policies and institutional contexts can either reinforce or mitigate the constraints faced by women. The impact of well-designed family policies is especially significant. Research indicates that measures such as paid parental leave, access to quality childcare services, and flexible working conditions can greatly reduce the professional penalties associated with motherhood. These policies create environments where reconciling career and family life becomes more achievable.

The analysis of regional disparities reveals striking contrasts. In developed countries, there is an encouraging trend where high female employment rates increasingly coexist with satisfactory fertility rates, thanks to appropriate support policies. This trend sharply contrasts with the situation in many developing countries, where the lack of institutional support and the persistence of traditional gender norms maintain a more antagonistic relationship between

female employment and fertility. These differences underscore the crucial importance of institutional and cultural context.

Ultimately, understanding the relationship between fertility and women's employment requires a truly holistic approach. Women's choices emerge from a complex constellation of interdependent factors: individual preferences, economic opportunities, cultural norms, and institutional supports. While different theories provide valuable analytical frameworks, their application must be nuanced and contextualized. This complexity highlights the importance of detailed and differentiated analyses according to specific contexts.

The major challenge for researchers and policymakers lies in translating this knowledge into concrete and effective actions. It is essential to develop policies that take into account the diversity of situations and needs. The ultimate goal is to create environments where women can truly choose and thrive in both their professional and family lives without having to sacrifice one for the other. This requires a comprehensive and nuanced political approach tailored to the specificities of each social and cultural context.

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