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"Explaining Variation in Child Penalties: The Role of Gender Norms and Policies"

RESEARCH

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ABSTRACT

This paper contributes to understanding global variation in child and marriage penalties by focusing on the role of patriarchal control, gender norms, and public policies. We introduce a new measure of gender norms, the Control Index, which captures women's '*freedom to choose*' in key areas of daily life, including mobility, marital choices, workplace rights, and financial independence. Using data from nearly 60 countries, we investigate the extent to which patriarchal control influences the child and marriage penalties, trying to disentangle the still unexplained part of the gender gap. Our findings reveal that higher levels of patriarchal control are strongly associated with larger marriage penalties. In particular, control over marriage decisions is closely correlated with both higher child and marriage penalties, while restrictions on women's financial autonomy contributes mainly to explaining marriage penalties. This suggests that, in addition to childcare-support policies, financial inclusion for women, could mitigate the effects of patriarchal control and conservative gender norms. Our analysis underscores the importance of addressing these norms alongside public policy interventions to reduce gender disparities in the labour market.

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1 INTRODUCTION

Despite significant convergence over the past century, the gender gap in labour markets persists in virtually all countries across multiple dimensions. These include employment, wages, promotions, and earnings (1, 2). Figure 1 illustrates the gender gap in employment across the world.

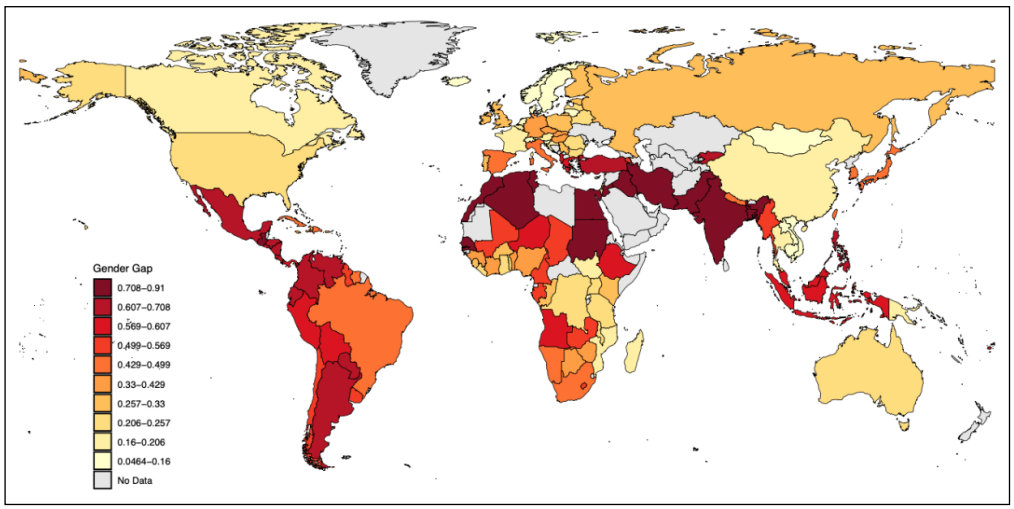

Figure 1 Heatmap of Gender Gap in Employment.

Recent research indicates that an increasingly large portion of this employment gap is attributable to the differing impact parenthood has on men and women. This impact, commonly referred to as the 'child penalty', disproportionately affects mothers. To date, the quantification of the child penalty has been limited to a few wealthy countries, as this analysis requires extensive longitudinal labour market data – a significant challenge for most low- and middle-income countries (3, 4).

In this piece, we rely on and expand our recent project 'The Child Penalty Atlas' (5), which bridges this gap via extensive data collection and methodological innovation to create a global atlas quantifying the child penalty in 134 countries. We build on the main findings from the Atlas regarding the relationship between child penalty and economic development through structural transformation. Alongside this, we examine other factors influencing the extent to which the child penalty explains the gender gap in employment, such as gender norms and public policies.

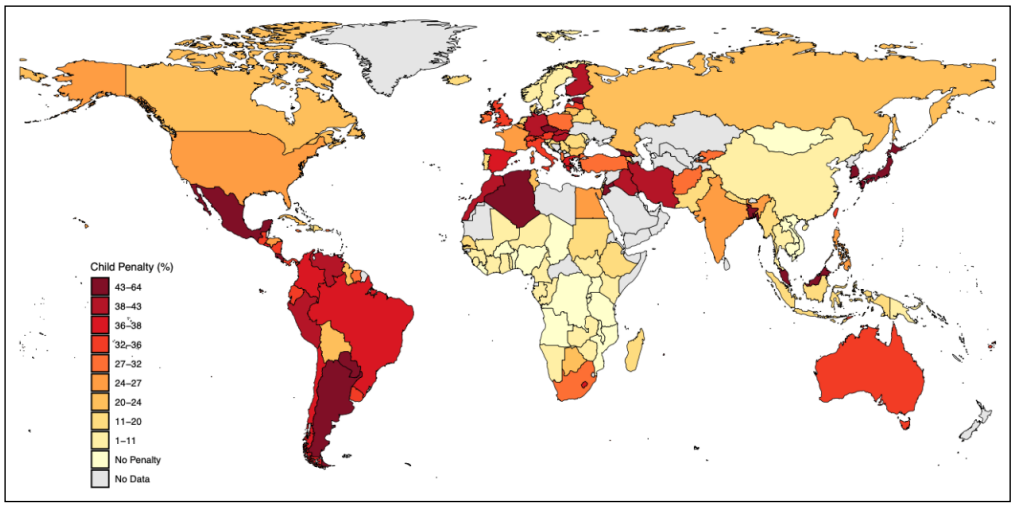

Figure 2 Heatmap of Child Penalties.

2 THE CHILD PENALTY ATLAS

Our recent project, 'The Child Penalty Atlas', quantifies the impact of parenthood on employment for men and women across the world. We overcome the previous challenges that limited the examination of child penalties beyond high-income countries with strong data in two main ways: employing a novel methodology that relaxes data requirements, and collecting and harmonising data for 134 countries, covering more than 95% of the world population.

Recent studies estimate child penalties through event studies of first childbirth using high-quality panel data, but such data are unavailable in most parts of the world. To overcome this

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constraint, we adopt the pseudo-event study approach developed in (6). This approach relaxes the requirement of extensive panel data, and allows for the estimation of child penalties using cross-sectional data. The approach uses matching on a set of observables to create a pseudo-panel from a cross-section of society. Where panel data are available, the results are validated against true event studies. This methodological innovation substantially increases the number of countries for which child penalty estimation is feasible.

The main goal of the Atlas is to quantify the child penalty and to investigate its importance as a driver of gender inequality in labour markets across the world. Two key findings arise: firstly, the child penalty is a universal phenomenon. As illustrated in Figure 2, in almost every country, the birth of a first child has a large and persistent negative impact on women's employment, whereas men's employment is unaffected. Secondly, despite its universality, there is enormous variation in the magnitude of the effects across different regions in the world.

At the continental level, Latin America has the largest child penalties globally (38%), while Africa has the smallest (9%). In Latin America, child penalties are consistently large across countries (37% in Brazil, 44% in Mexico), with very few exceptions (noticeably, Cuba with 23%). In Africa, there is more heterogeneity across countries: very low-income countries of Central and Western Africa feature small or zero penalties (7% in Cameroon, 4% in Zimbabwe), whereas the middle-income countries of Northern and Southern Africa feature large penalties (41% in Morocco, 28% in South Africa). In Europe, we find similar variation, but the child penalties are on average much higher. Scandinavian countries have smaller penalties (9% in Sweden, 3% in Norway), whereas Western and Central-European countries have much larger penalties (33% in the UK, 41% in Germany). In Asia, we find the largest degree of heterogeneity: Southeast Asian nations have very small penalties (1% in Vietnam), whereas East-Asian and South-Asian countries have some of the highest penalties in the world (45% in Japan, 62% in Bangladesh).

Why is the child penalty so different across countries? While we cannot answer with certainty, comparing results across countries reveals several interesting patterns, which we investigate next.

3 ECONOMIC DEVELOPMENT AND STRUCTURAL TRANSFORMATION

In the Atlas, we investigate the relationship between economic development and the child penalty, as illustrated in Figure 3. We find that child penalties are higher in more urbanized societies (Figure 3A), that rely less on agriculture (Figure 3B), and more on salaried work (Figure 3C) in industry and services (Figure 3D).

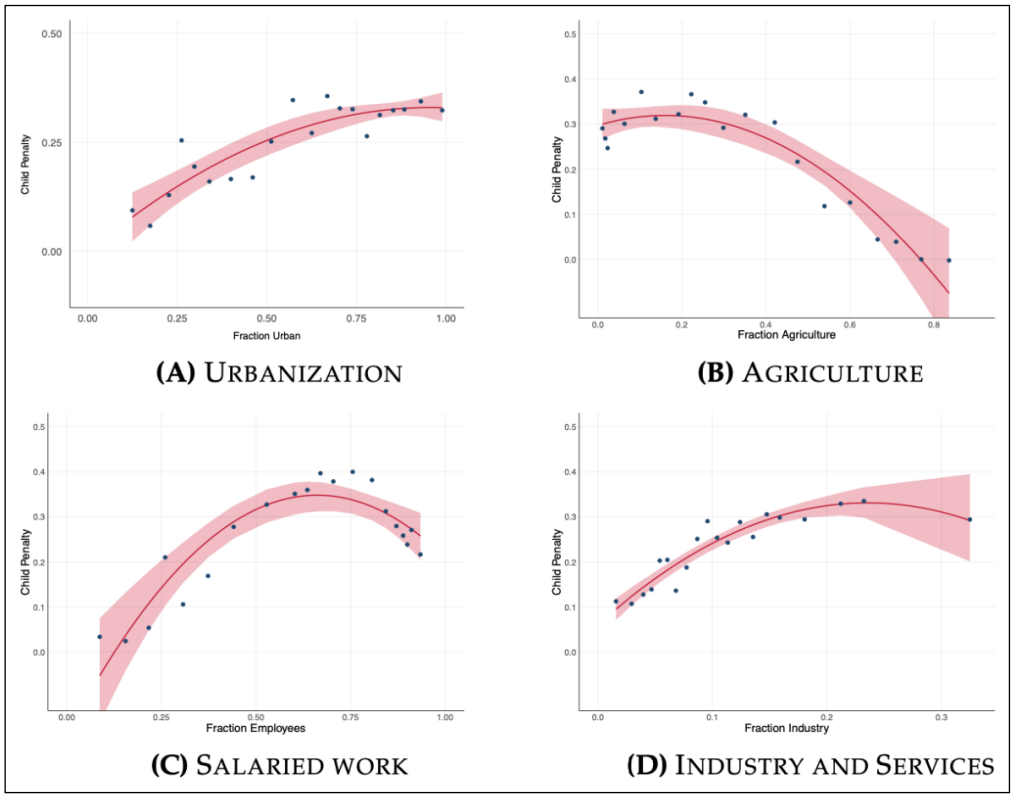

Figure 3 Child Penalty and Structural Transformation.

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These patterns align with the idea that urbanization and the shift away from farming create a separation between home and the workplace. This makes childcare a more significant barrier to work, which has strongly gendered consequences: men remain unaffected, while women often bear the entire burden.

3.1 CHILD PENALTIES, MARRIAGE PENALTIES AND THE GENDER GAP ACROSS THE DEVELOPMENT PATH

Figure 4 illustrates the total gender gap in employment across different levels of GDP per capita. The resulting inverted U-shaped relationship between the total gender gap and development has been well-documented in previous studies (see e.g., 7, 8, 9). At early stages of development, female employment decreases with GDP per capita, and the gender gap therefore increases. This gap reaches a peak around the middle of the development process, and then begins to decline at higher income levels.

Although parenthood is a significant determinant of gender inequality, the child penalty is only one of the relevant factors. In a hypothetical scenario where no woman works before or after having children, the child penalty would be zero but the gender gap would be large. This implies that, for every country, we can divide the child penalty by the total gender gap to quantify how much of the gap can be explained by the child penalty. Since parenthood is often tied to marriage, we also investigate the existence of marriage penalties in female employment, considering the first marriage as a critical event in the life of women, even before having a child.

We investigate the relationship between child penalties, marriage penalties, and economic development in greater detail below. Figure 5 deconstructs the gender gap in employment at each level of GDP per capita into a child-related gender gap, a marriage-related gender gap, and a residual gender gap.

Two key patterns emerge from the figure. The first is the enduring rise in child-related gender inequality. Child penalties are virtually non-existent at early stages of development, but increase steadily as income per capita grows. The second pattern is the evolution of marriage-related gender inequality.

Unlike child penalties, marriage penalties are sizeable even at low levels of development. At intermediate levels, they remain substantial before declining at advanced levels. The total impact of family formation – marriage and children combined – explains about 50% of the gender gap at low and intermediate income levels and about 100% at high income levels. In fact, the residual gender gap turns marginally negative at the highest income levels. This means that, if not for the impact of family formation on the gender division of labour, women would be ahead of men in advanced economies.

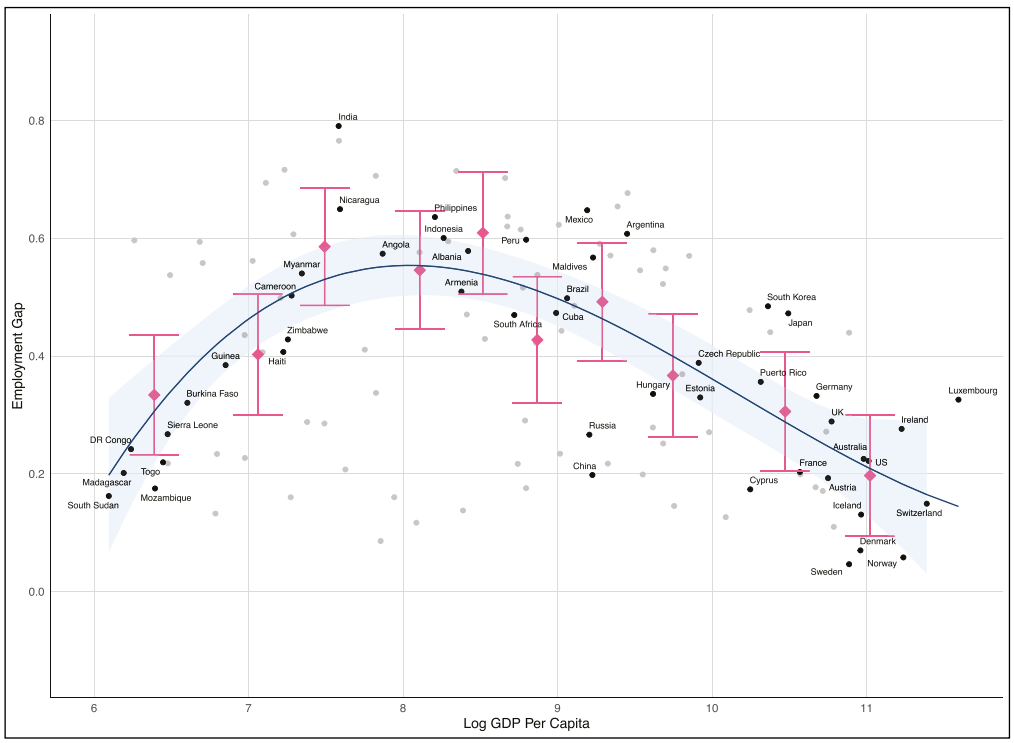

Figure 4 Gender Gap in Employment vs GDP Per Capita.

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These patterns are striking and help us conclude that in most wealthy nations, the child penalty explains virtually the entire gender gap. In other countries, however, a significant part of the gender gap remains unexplained. In very low-income countries, there is a substantial gender gap and a sizeable marriage penalty, but almost no child penalty. This indicates that the inequality between men and women is driven by factors that predate the arrival of children. While we remain generally agnostic about these other factors, which may include policies, education or cultural norms, we explore this aspect further below.

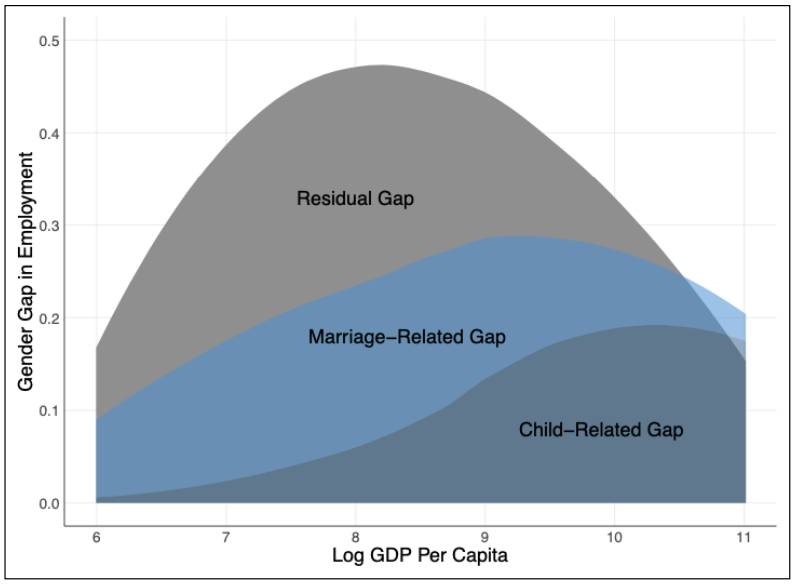

Figure 5 Decomposition of Gender Gap by Levels of Development.

4 THE ROLE OF GENDER NORMS AND POLICIES

To investigate the effect of gender norms, we first examine the relationship between the level of economic development and a measure of patriarchal control over women using data from the Women, Business, and the Law 1.0 2024 dataset (10). The dataset includes several questions that elicit attitudes regarding the role and rights of women in society from 1971 to 2024. We construct a Control Index by taking the first principal component from a Principal Component Analysis (PCA) on a set of binary responses (1 = yes, 0 = no) from selected questions concerning *'freedom to choose'* of women in six categories in the report: marriage, assets, mobility, workplace, pay, and entrepreneurship. The complete list of questions considered to build the index can be found in Table 2. A higher value of the control index indicates less freedom for women, thus reflecting a more patriarchal society.

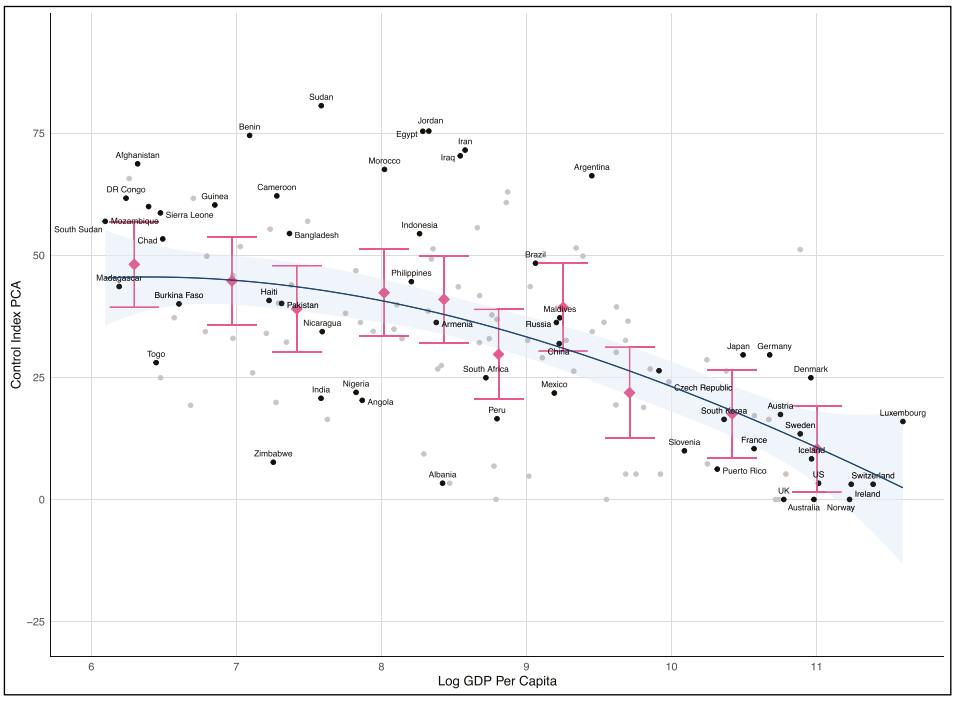

Figure 6 Control Index vs GDP Per Capita.

Figure 6 plots the Control Index against GDP per capita. We observe that, at low levels of economic development, male control over women's decisions is very high, suggesting the presence of more patriarchal societies. This control declines significantly at around a GDP per capita of approximately 9 log-points, which corresponds to middle-income countries where the education gap starts closing (11, 12), and also where the gender gap is the highest.

This result suggests that the absence of significant child penalties observed in the lowest-income countries is not due to weaker patriarchal gender norms or greater female autonomy. Instead, patriarchal control exists, yet does not directly translate into child penalties in employment. This finding suggests that the relationship between economic development and child penalties is not straightforward. One possible explanation is that factors beyond direct structures of control, such as the structure of the labour market, public policies, and broader gender norms, significantly influence child penalties.

Next, we turn to the role of prevailing gender norms and government policies beyond those directly referring to patriarchal control over household and family decision-making. To conduct this analysis, we regress both child penalties and marriage penalties onto a number of potential explanatory variables: the level of economic development, public spending on childcare (proxied by government spending on pre-primary education, as reported by (13)), conservative sentiment in the country (proxied by the share of people who either agree or strongly agree with the statement 'when jobs are scarce, men should have more right to a job than women' in the latest wave of the International Values Survey[1]), and the previously mentioned control index.

Comparison of correlational analyses reveals interesting patterns for child penalties and marriage penalties with respect to gender norms. Figure 7 plots the estimates from regressions on both child penalty and marriage penalty. The decomposition shown in Figure 5 shows that child penalties increase with the level of economic development, whereas marriage penalties decrease. Increased pre-primary expenditure significantly lowers the marriage penalty and also affects the child penalty. Conservative attitudes, as measured by agreement with the IVS question on gender roles, increase both penalties, with a stronger effect on the marriage penalty. Lastly, concerning the proxy of gender norms, a higher control index, indicating a more patriarchal society, is associated with both a higher marriage penalty and a higher child penalty.

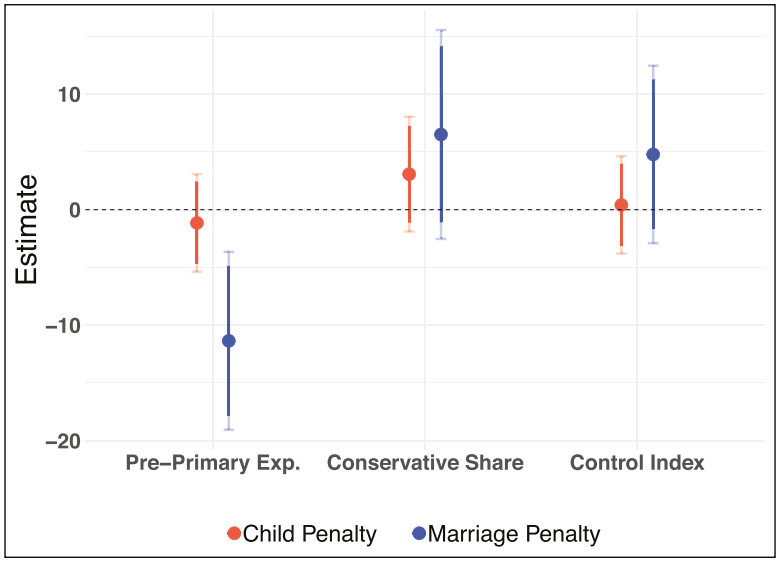

Figure 7 Regression Estimates.

Note: This graph plots the estimated coefficients of pre-primary expenditure, control index, and conservative share on child penalty and marriage penalty. The estimates are controlled for quintiles of GDP.

In line with the above analysis, the relevant factor that is most correlated with child penalties is the level of economic development. Figure 7 highlights that in the case of marriage penalties, the key factors are the level of childcare expenses (which are negatively correlated) and gender norms, proxied by conservative sentiment and the control index, both of which show a positive correlation.

Furthermore, as explained above, the control index is composed of individual components, as detailed in Table 2. To assess the importance of each component in explaining the observed variation in child and marriage penalties, Table 1 shows the average additional explanatory

1 A harmonized dataset combining answers to similar questions from the European Values Survey and the World Values Survey.

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power of each variable. We compute this measure by successively adding each variable into a regression and calculating the difference in R-squared between the model with k covariates and the model with k – 1 covariates. Importantly, the order in which each variable is added is an arbitrary choice that influences its additional explanatory power. To address this issue, we run all possible permutations of variable sequences and take the average additional explanatory power of each variable across all iterations.

We investigated which areas of interest are the main drivers behind the correlations mentioned earlier. To do this, we conducted a principal component analysis (PCA) on the individual components of the control index by area and recomputed the additional explanatory power of each variable when included in a regression, always controlling for the level of economic development. The results reveal that the marriage score and Log GDP quintiles are the most significant factors influencing the child penalty, highlighting a strong association between marriage-related variables, economic development, and the impact of having children. For the marriage penalty, the marriage score and assets score are the most influential variables, suggesting that the stability of family relationships and control over individual financial assets are key in explaining a higher employment penalty after marriage. In contrast, variables related to mobility and the workplace have relatively less explanatory power for both penalties, suggesting that factors associated with social mobility and workplace conditions – e.g., paid parental leave or flexible working hours – contribute less significantly to these outcomes.'

Overall, this analysis confirms that economic development is the key factor influencing child penalties, while marriage penalties appear to be primarily driven by childcare expenses (proxied by pre-primary expenditure), conservative gender norms in marriage decisions, and the management of financial assets. In line with this narrative, it can be argued that in societies where women have less freedom to choose their partner or manage their financial assets, marriage itself acts as a barrier to women's labour market participation, even before they have their first child. These findings highlight that, in addition to policy-supported childcare, financial inclusion policies targeting vulnerable women in less economically developed countries, as well as a deeper understanding of marriage dynamics, could be pivotal for policymakers in addressing the gender gap in employment and disentangling the part of the gender gap that remains unexplained.

Table 1 Average Additional Explanatory Power of variables for Child Penalty (CP) and Marriage Penalty (MP).

VARIABLE	CHILD PENALTY	MARRIAGE PENALTY
	ADDITIONAL POWER	ADDITIONAL POWER
Assets Score	0.0196	0.0668
Entrepreneurship Score	0.0112	0.0057
Marriage Score	0.1354	0.1765
Mobility Score	0.0164	0.0165
Pay Score	0.0135	0.0293
Workplace Score	0.0128	0.0187
Log GDP Quintiles	0.1337	0.0312

5 CONCLUSION

This article has provided a preliminary examination of the global variation in child and marriage penalties, with a particular focus on the role of patriarchal control, gender norms, and public policies in shaping these disparities. Our previous project has shown that child penalties are a near-universal phenomenon, although their magnitude varies significantly between countries, with higher penalties often observed in more urbanized and economically developed nations.

The main contribution of this paper is the introduction of the control index, a novel measure of gender norms that captures the extent of patriarchal control over women's lives, particularly in terms of mobility, marital choices, workplace rights, and financial independence. Our analysis highlights how this index provides a new lens through which to understand the interplay between economic development, structural transformation, and gender norms in driving child and marriage penalties. We find that economic development alone cannot fully explain the global variation in penalties. Instead, societies with stronger patriarchal control experience significantly higher child and marriage penalties, demonstrating the importance of gender norms in shaping labour market outcomes.

In conclusion, addressing the child penalty requires a multifaceted approach that not only promotes economic development but also fosters gender-equal norms and implements comprehensive policies. Public policies should target not just childcare infrastructure but also broader gender inequalities, particularly those affecting women's autonomy and financial inclusion. Additionally, the persistence of marriage penalties in lower-income countries underscores the need for targeted interventions to enhance women's autonomy both within and outside the household. The introduction of the control index offers a valuable tool for understanding and addressing these inequalities, paving the way for future research into the unexplained aspects of the gender gap in employment.

APPENDIX

Table 2 Control Index Composition.

CATEGORY	QUESTION
Marriage	The law is free of legal provisions that require a married woman to obey her husband
	A woman can be head of household in the same way as a man
	There is legislation specifically addressing domestic violence
	A woman can obtain a judgment of divorce in the same way as a man
	A woman has the same rights to remarry as a man
Assets	Men and women have equal ownership rights to immovable property
	Sons and daughters have equal rights to inherit assets from their parents
	Male and female surviving spouses have equal rights to inherit assets
	The law grants spouses equal administrative authority over assets during marriage
Mobility	Whether a woman can choose where to live in the same way as a man
	Whether a woman can travel outside her home in the same way as a man
	Whether a woman can apply for a passport in the same way as a man
	Whether a woman can travel outside the country in the same way as a man
Workplace	Whether a woman can get a job in the same way as a man
	Whether the law prohibits discrimination in employment based on gender
	Whether there is legislation on sexual harassment in employment
	Whether there are criminal penalties or civil remedies for sexual harassment in employment
Pay	Whether the law mandates equal remuneration for work of equal value
	Whether a woman can work at night in the same way as a man
	Whether a woman can work in a job deemed dangerous in the same way as a man
	Whether a woman can work in an industrial job in the same way as a man
Entrepreneurship	Whether the law prohibits discrimination in access to credit based on gender
	Whether a woman can sign a contract in the same way as a man
	Whether a woman can register a business in the same way as a man
	Whether a woman can open a bank account in the same way as a man

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COMPETING INTERESTS

The authors have no competing interests to declare.

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