Fiscal Pathways to Gender Equality: Evidence from Gender-Responsive Budgeting in Emerging Asia

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Abstract

This paper provides the first comprehensive, multi-method evaluation of gender-responsive fiscal interventions across 15 emerging Asian economies from 1990-2023. Unlike prior descriptive or single-country studies, it deploys a layered empirical design- two-way fixed effects, instrumental variables, quantile regression, threshold models, and a synthetic control case study of India- to establish both average and distribution-sensitive impacts. The analysis demonstrates that Gender Responsive Budgeting (GRB) significantly improves gender development and reduces inequality, but only when institutional quality, fiscal capacity, female education, and demographic thresholds are met. Disaggregated results show that conditional cash transfers are most effective in low-GDI contexts, while tax incentives for women entrepreneurs yield stronger effects in high-capacity states. India's 2005 GRB reform, evaluated via synthetic control, confirms substantial gains in GDI and declines in GII when enabling conditions are satisfied. By propagating a threshold-driven fiscal transformation, this study offers policymakers a roadmap for integrating gender equity in public finance.

Keywords: Gender Responsive Budgeting (GRB), Fiscal Policy, Emerging Asian Economies, Threshold Effects, Synthetic Control Method

JEL Codes: C21, C33, E62, H50, J16

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1. Introduction

Fiscal policy has re-emerged at the center of developmental discourse, recognized as a decisive tool for steering economies toward inclusive and equitable growth (Gaspar et al. 2019). With monetary policy increasingly constrained and inequality widening in many countries, fiscal measures- from targeted

transfers to public investment and taxation- are being re-evaluated for their distributional impacts (Bastagli et al. 2012; IMF 2022). In emerging Asia, where rapid economic growth coexists with persistent structural inequities, the stakes are particularly high. Governments are under pressure to both stimulate growth and rebalance outcomes that have historically excluded large portions of the population (OECD 2021; Tanzi and Zee 2000). One of the most enduring and multidimensional forms of inequality is gender inequality. Across the region, women continue to experience lower labor force participation, higher informal employment, disproportionate care burdens, restricted access to assets, and underrepresentation in decision-making structures (World Bank 2022). These gaps are not only morally indefensible but also economically inefficient. Gender disparities in education, employment, and finance lower aggregate productivity, shrink national income, and perpetuate intergenerational poverty (Elborgh-Woytek et al. 2013; Cuberes and Teignier 2016). The IMF estimates that closing gender gaps could boost GDP by over 30 percent in some economies (Ostry et al. 2018).

Despite the known benefits, fiscal policy has often remained gender-blind. Most national budgets do not assess the gender impact of allocations or link fiscal commitments to gender outcomes (Downes and Nicol 2020). Gender budgeting, when introduced, has frequently lacked analytical rigor, rendering reforms ineffective beyond symbolic gestures (Herten-Crabb and Wenham 2022). Moreover, conventional public finance metrics rarely reflect how resources are distributed across gendered lines or how they reinforce or reduce existing power asymmetries (O'Donnell et al. 2020). To address this, the case for integrating gender-responsive frameworks into core fiscal architecture has grown stronger. Emerging evidence suggests that well-designed fiscal strategies, ranging from conditional cash transfers and care-sensitive tax systems to gender-focused social protection, can play a transformative role in closing gender gaps when tailored to local institutions and demographics (Grown and Valodia 2010; IMF 2022). But as this study argues, impact is conditional: policies only work when designed contextually and implemented within structurally conducive environments.

This paper contributes to that conversation by offering a regionally grounded, empirically robust, and policy-relevant analysis of how fiscal strategies influence gender outcomes. It does so by examining the role of Gender Responsive Budgeting (GRB)[1] and five key gender-focused fiscal policy interventions- conditional cash transfers, tax incentives, employment programs, equality-linked legal frameworks, and social protection schemes- across the 15 major emerging Asian economies from 1990 to 2023. The study covers a broad and diverse sample, including countries from South, Southeast, East, and Central Asia, offering comparative insights across different governance models, economic structures, and demographic profiles.

[1] Gender Responsive Budgeting (GRB) integrates gender perspectives into fiscal policy to promote equity in resource allocation and outcomes (Chakraborty 2016).

This study breaks new ground in its comprehensive and layered approach. Rather than assuming a universal effect, it explores when and under what conditions gender-responsive fiscal policies actually improve outcomes. It uses a multi-method empirical framework to account for variation across space and time. The methodological design combines baseline panel estimation, quantile regression, threshold modeling, and a synthetic control case study to ensure both causal identification and distributional insight. This level of empirical layering enables the research to move beyond averages and uncover asymmetries in policy effectiveness.

The findings are as important as they are nuanced. The analysis shows that GRB positively impacts GDI[2] and reduces GII[3], but only significantly in countries that meet certain threshold levels of institutional effectiveness, fiscal capacity, female education, and demographic leverage. This illustrates that even the best-designed fiscal interventions may fail if foundational structures are weak. Equally, the five fiscal instruments studied exhibit heterogeneous effects: for instance, conditional cash transfers have strong results in low-GDI contexts, while tax incentives for women entrepreneurs are most effective in high-governance, high-capacity states.

By identifying these nuances, this research advances a threshold-informed theory[4] of fiscal transformation. It argues that the success of gender-responsive fiscal tools is not merely a matter of good design, but of contextual readiness. This marks a departure from normative appeals for gender budgeting (Downes and Nicol 2020) and offers instead a sequencing strategy- a roadmap that links policies to prerequisites. It is this practical orientation that gives the study added value for policymakers.

Crucially, this research also delivers actionable policy recommendations. It not only identifies what works, but for whom, where, and why. In doing so, it empowers governments, multilateral institutions, and fiscal reform think tanks to calibrate interventions more effectively. At a time when post-pandemic recovery paths are being designed, debt burdens are rising, and policy trade-offs are tightening (Gaspar et al. 2019), this paper shows that investing in gender-equitable fiscal architecture is both economically rational and politically urgent. Finally, this work offers a new lens for viewing fiscal policy- not just as a vehicle for macroeconomic stability or growth, but as a deliberate instrument of gender justice. It blends theoretical rigor with empirical depth and anchors its analysis in the realities of developing country contexts. For emerging Asia, and for the broader global South, it represents a timely and transformative contribution to the agenda for inclusive growth.

[2] The Gender Development Index (GDI) measures gender gaps in health, education, and income, making it a key indicator for evaluating the developmental impact of gender-responsive fiscal policies (Klugman et al. 2011).
[3] The Gender Inequality Index (GII) reflects structural disparities in health, empowerment, and labor markets, serving as a vital measure for evaluating the equity impact of public finance (Elson 2002).
[4] A threshold-informed theory holds that policy interventions become effective only after surpassing specific critical levels of structural or institutional enablers, highlighting the non-linear nature of development outcomes (Rodrik 2007).

2. Brief Review of Literature

The following literature review is structured into three thematic sections that progressively build from broad theoretical foundations to empirical evidence and, ultimately, to the gaps that this paper addresses. Together, they establish the background on which this research stands.

2.1. Fiscal Policy and Equity

Fiscal policy has long been central to debates on redistribution, yet only in recent decades has its role in fostering inclusive development been framed explicitly within equity-centered paradigms. While early Keynesian frameworks prioritized fiscal spending for aggregate demand stabilization, contemporary approaches increasingly recognize fiscal architecture as a normative structure- one that distributes opportunity, agency, and well-being (Gaspar et al. 2019; Atkinson 2015). This reframing reflects the broader shift toward equity-oriented macroeconomics, where growth is evaluated not just by output but by its inclusivity (Lustig 2018). The recognition of fiscal policy as a social contract has grown in traction, especially in the context of post-crisis recoveries and widening inequality (Tanzi and Zee 2000; Chakraborty 2016). Scholars argue that public finance systems carry embedded power structures that influence who benefits from state capacity and whose needs are overlooked (Prichard 2015). Thus, tax policies, expenditure priorities, and budget design are no longer viewed as neutral tools of technical governance but as political instruments of inclusion or exclusion. Within development discourse, the idea that fiscal systems can advance structural transformation by enabling access to education, healthcare, infrastructure, and employment has gained momentum. Rodrik (2007) emphasizes that "second-best" institutions, when aligned with local conditions and distributional objectives, can generate outsized developmental returns. Similarly, Bastian and Busemeyer (2021) show how fiscal states designed around inclusion strengthen social trust and political stability.

Yet much of this theoretical evolution has not adequately addressed gendered dimensions of inequality. While the role of fiscal tools in addressing income inequality has been extensively studied (IMF 2014; Bastagli et al. 2012), gender-specific exclusions within public finance remain under-theorized or treated as peripheral. The fiscal system's capacity to transform gender relations, through redistributive spending, targeted taxation, or service delivery, has only recently been placed on equal footing with broader equity agendas. This leaves a crucial gap: while theories of inclusive fiscal policy are well developed, they often lack gender-responsive frameworks. Bridging this disconnect is essential to realizing fiscal systems as engines of equity in both economic and social terms.

2.2. Gender in Fiscal Discourse

The integration of gender within fiscal discourse emerged primarily through the lens of Gender Responsive Budgeting (GRB)- a policy innovation aimed at aligning public expenditure with the goal of gender equality. Initially introduced in Australia in the 1980s, GRB spread across various national

contexts, especially through UN and multilateral advocacy during the late 1990s and early 2000s (Budlender and Hewitt 2003). Conceptually, GRB was grounded in feminist critiques of public finance, which emphasized that budgets are not neutral instruments, but reflect societal priorities and institutional biases (Elson 2002). Despite early momentum, GRB has often remained symbolic or project-based, lacking integration into mainstream macroeconomic frameworks. As Quinn (2009) and Sharp and Broomhill (2013) argue, GRB initiatives frequently focus on inputs and intentions- such as gender tagging or budgeting templates- without monitoring actual outcomes or structural shifts in gender relations. This disconnect has contributed to what Grown and Valodia (2010) call a "missing middle" in gender budgeting: strong normative commitments, but weak institutionalization and accountability. Empirical applications of GRB have centered around sectoral budgeting in education, health, and social protection- important, but often siloed from core fiscal decision-making, such as tax policy, infrastructure, or fiscal rules (Downes and Nicol 2020). In many countries, GRB is managed by gender ministries or planning commissions, while finance ministries maintain control over allocation and oversight, creating fragmented mandates and diluted impact (Budlender and Sharp1998).

Feminist economists have also critiqued the limited evaluative tools used in gender budgeting. Much of the existing literature emphasizes processes like stakeholder participation, budget circulars, and gender statements, while few studies quantify macro-level outcomes like reductions in gender inequality or improvements in female labor force participation (Kabeer and Natali 2013). There is growing recognition that GRB must move beyond advocacy to become a fully integrated evaluative framework embedded within national fiscal institutions. This calls for a shift from gender-aware to gender-accountable fiscal systems, supported by robust data, causal analysis, and institutional incentives. Yet many of these advancements remain underdeveloped, particularly in emerging economies where fiscal and gender governance systems often evolve on separate tracks. This is the critical space where empirical research must deepen.

2.3. From Evidence to Gaps

Empirical evidence linking fiscal policy to gender outcomes has expanded in recent years, though it remains uneven in rigor, scope, and methodological innovation. Much of the applied work on GRB and gender-focused fiscal tools remains qualitative or single-country in design, often lacking generalizability or longitudinal depth (Budlender and Hewitt 2003). Studies tend to evaluate administrative performance, such as whether budgets include gender markers or departments apply gender-sensitive templates, rather than measuring outcomes like improvements in the Gender Development Index (GDI) or reductions in the Gender Inequality Index (GII). Moreover, where quantitative approaches have been used, they tend to rely on average treatment effects, ignoring how fiscal tools perform across different levels of development or institutional quality. For instance, research often shows positive associations between cash transfers or subsidized childcare and female labor force

participation (Buvinic et al. 2020), but does not explore heterogeneous effects across countries or demographic groups. Similarly, macroeconomic analyses examining gender equality and GDP gains often lack granularity on which fiscal instruments drive these changes and under what enabling conditions (Seguino 2019).

The lack of distributional diagnostics, such as quantile regression, which accounts for asymmetries in policy impact, means that fiscal interventions are frequently assumed to be uniformly effective. Likewise, few studies apply threshold models to understand the tipping points of policy success: how government effectiveness, fiscal capacity, or female education enrollment affects the functionality of gender-sensitive fiscal strategies. In practice, countries with the same policy may experience very different outcomes, but existing literature offers little insight into why. There is also a geographical gap: Asia's emerging economies remain underrepresented in empirical fiscal-gender research, despite the region's institutional diversity, demographic complexity, and critical development transitions. Most GRB evaluations focus on Europe, Latin America, or a few high-capacity African states (Khan 2020). Yet Asia presents a compelling case to explore not only whether fiscal strategies work but also how they adapt across governance systems and policy histories.

This paper responds directly to these gaps by offering a multi-method, cross-country analysis of 15 major Asian emerging economies from 1990 to 2023. It evaluates the impact of GRB and five key gender-focused fiscal strategies (cash transfers, tax incentives, employment programs, legal-policy frameworks, and social protection) on GDI and GII. It employs methods that capture distributive heterogeneity (quantile regression), identify structural enablers (threshold regression), and test causal divergence (synthetic control analysis) through a detailed case study of India. By addressing the limitations in scope, methodology, and regional focus identified in prior literature, this study advances a deeper understanding of the conditions, instruments, and institutional settings under which fiscal policy can meaningfully promote gender equity. In doing so, the paper addresses the following key research questions:

a) Has Gender Responsive Budgeting (GRB) improved gender development and reduced inequality in emerging Asian economies?
b) How effective are different gender-focused fiscal policies in shaping gender outcomes?
c) Do these fiscal strategies work equally across countries, or do results vary by development levels?
d) What institutional, fiscal, and demographic conditions are needed for these policies to succeed?
e) Can national interventions, such as India's implementation of GRB since 2005, generate measurable macro-level improvements when deployed in threshold-compliant environments?

3. Data and Variables

This study builds on a structured panel dataset covering the period 1990 to 2023 for a set of 15 major emerging economies in Asia: Bangladesh, Cambodia, China, India, Indonesia, Kazakhstan, Malaysia,

Myanmar, Nepal, Pakistan, Philippines, Sri Lanka, Thailand, Uzbekistan, and Vietnam. The selection of these countries is based on their mean nominal GDP over 25 years (2000-2024) among all Asian nations classified as Developing Member Countries (DMCs) by the Asian Development Bank (ADB)[5]. This long-run economic benchmark ensures that the countries selected are not only regionally significant in terms of macroeconomic size but also strategically relevant for fiscal and developmental analysis. As a group, they represent a spectrum of fiscal capacities, institutional development levels, and demographic profiles, offering a rich basis for comparative policy evaluation.

The dependent variables, Gender Development Index (GDI) and Gender Inequality Index (GII), are sourced from the Human Development Data of the United Nations Development Programme (UNDP)[6]. GDI captures the gender-specific disaggregation of human development achievements (education, income, and life expectancy), while GII reflects structural inequality across reproductive health, empowerment, and labor participation. The simultaneous use of these two indices enables a comprehensive evaluation of gender outcomes in both absolute and relative terms (Klugman et al. 2011).

The study includes six binary policy intervention variables: Gender Responsive Budgeting (GRB) and five gender-targeted fiscal strategies- conditional cash transfers (CCT), tax incentives for women entrepreneurs (TAX), employment and skilling programmes (EMPGP), gender equality legal frameworks with budget ties (EQUAL), and social protection/insurance schemes for women (SOCPROT). These were manually coded from official national policy documents, budget archives, and country-specific legislative records, with year-wise implementation summarized in Appendix Tables A1-A5. The selection of these policy dummies aligns with global feminist fiscal frameworks[7] (Budlender and Sharp 1998; Elson 2002) and reflects the institutional breadth of GRB across direct spending, tax policy, labor markets, social protection, and legal commitments. These dummies are key to measuring the policy architecture of gender-inclusive public finance beyond rhetorical commitments (Downes et al. 2020).

To ensure robust estimation, the model includes key macroeconomic and governance control variables drawn from the World Development Indicators (WDI- World Bank): net national income per capita growth, GDP per capita growth, female population share, life expectancy at birth (female), and governance indicators like Rule of Law, Voice and Accountability, and Government Effectiveness. These variables help isolate policy impacts by accounting for structural and institutional differences in economic capacity and state functionality (Lustig 2018; Rodrik 2007). Additionally, this study uses the WDI database for four variables which are employed as structural enablers or threshold constraints in

[5] https://www.adb.org/sites/default/files/institutional-document/31483/om-a1.pdf
[6] https://hdr.undp.org/data-center
[7] Global feminist fiscal frameworks emphasize restructuring public finance to address systemic gender inequalities through equitable budgeting, taxation, and spending priorities (Grown and Valodia 2010).

nonlinear estimation: Government Effectiveness (institutional quality), Government Expenditure (% of GDP) (fiscal capacity), female secondary school enrolment (educational leverage), and female population (demographic weight). These enablers are theoretically grounded in equity-focused public finance literature (Grown and Valodia 2010; Chakraborty 2016) and operationalize the conditions necessary for gender budgeting to become functionally effective.

4. Empirical Strategies

This section outlines the multi-pronged empirical strategy employed in this study. It proceeds in four closely integrated stages: starting with baseline estimations using two-way fixed effects (TWFE), then testing for robustness using instrumental variable (IV) methods, followed by quantile regressions to assess distributional heterogeneity, and threshold models to identify structural constraints/enablers. The section concludes with a synthetic control analysis for causal evaluation of policy intervention.

4.1. Baseline Estimation: Two-Way Fixed Effects and Instrumental Variable Approach

To estimate the average effect of Gender Responsive Budgeting (GRB) and related fiscal strategies on gender development outcomes, this paper begins with a two-way fixed effects (TWFE) panel regression model. This approach accounts for time-invariant heterogeneity across countries and common shocks over time, a structure well-suited for multi-country, longitudinal studies in public finance (Lustig 2018; Bastian and Busemeyer 2021). The baseline specification is:

$$Y_{it} = \theta + \beta_1 GRB_{it} + \varphi X_{it} + \alpha_i + \mu_t + \varepsilon_{it} \quad (1)$$

Where Y_{it} is the outcome variable (GDI or GII) for country i in year t. GRB_{it} represents the key explanatory variable (presence of GRB), X_{it} is a vector of control variables, α_i and μ_t capture country and time fixed effects, and ε_{it} is the idiosyncratic error term. Next, the model is extended to include five dimensions of GRB representing distinct fiscal strategies: conditional cash transfers, tax incentives, employment programs, equality-tied legal frameworks, and social protection schemes. The extended model becomes:

$$Y_{it} = \theta + \beta_1 \widehat{FiscStrat}_{it} + \varphi X_{it} + \alpha_i + \mu_t + \varepsilon_{it} \quad (2)$$

Where $\widehat{FiscStrat}_{it}$ is any one of the five dimensions of GRB representing distinct fiscal strategies for country i in year t.

To ensure robustness and address potential endogeneity, a two-stage least squares (2SLS) instrumental variable (IV) strategy is employed. GRB and each policy dimension are instrumented using four structural variables: government expenditure as a share of GDP (GovExp), female secondary school enrollment, (FemSec) female population share (FemPop), and gender development/equality (Gender)

status. These instruments satisfy both theoretical relevance and exclusion criteria (Lustig 2018; Chakraborty 2016; Prichard 2015). Here, I use the following first-stage regression to predict:

$$\widehat{FiscStrat}_{it} = \theta + \beta_1 GovExp_{it} + \beta_2 FemSec_{it} + \beta_3 FemPop_{it} + \beta_4 Gender_{it} + \varepsilon_{it} \quad (3)$$

This average-effect model provides the empirical foundation for the next stage, where we turn to quantile regression to assess how these impacts differ across the distribution of gender development outcomes.

4.2. Quantile Regression: Capturing Distributional Heterogeneity

While the baseline TWFE-IV model identifies average treatment effects, it cannot detect how the impact of GRB or fiscal strategies varies across countries at different stages of gender development. To capture this distributional heterogeneity, I implement quantile regression, which estimates effects at various points (deciles) of the outcome distribution, rather than the mean (Koenker and Bassett 1978). This approach is particularly useful in development economics, where policy effects are often nonlinear and asymmetric across levels of inequality. The quantile regression model is expressed as:

$$Q_\tau(Y_{it}|FiscStrat_{it}) = \theta + \beta_\tau FiscStrat_{it} + \varphi_\tau X_{it} + \alpha_i + \mu_t \quad (4)$$

Where $Q_\tau(Y_{it})$ denotes the τ^{th} conditional quantile (e.g., 10^{th}, 50^{th}, 90^{th} percentile) of the outcome variable. $FiscStrat_{it}$ is the key predictor that includes either GRB or any of the five dimensions of GRB representing distinct fiscal strategies. The estimated coefficients β_τ reveal whether policy interventions are more or less effective at different levels of gender development or inequality. This method uncovers critical policy asymmetries- for example, whether GRB benefits are concentrated in high-performing countries or disproportionately favor lower-GDI contexts- providing a nuanced lens through which to interpret fiscal effectiveness (Seguino 2019). The quantile-based results lay the foundation for identifying underlying structural conditions, which this study examines next through threshold regression.

4.3. Threshold Regression: Identifying Structural Enablers

To complement the distributional insights from quantile regression, threshold estimation is employed to examine whether the impact of gender-responsive budgeting and fiscal strategies is contingent upon structural enablers. Threshold regression allows for a formal test of nonlinearities, where the marginal effect of a policy variable changes once a certain threshold of an institutional or demographic characteristic is crossed (Hansen 2000). Such discontinuities are particularly relevant in the context of fiscal interventions, where state capacity, demographic leverage, or educational attainment often mediate policy effectiveness.

This paper identifies four threshold variables: government effectiveness, public expenditure as a share of GDP, female secondary school enrollment, and female population share. These dimensions are

supported in the literature as foundational to the success of equity-enhancing public finance (Lustig 2018; Chakraborty 2016; Grown and Valodia 2010; Rodrik 2007). The estimation follows a split-sample approach, modeled as:

$$Y_{it} = \begin{cases} \theta_1 + \beta_1 \, GRB_{it} + \varphi_1 \, X_{it} + \alpha_i + \mu_t + \varepsilon_{it}, & if \; Z_{it} \leq \lambda \\ \theta_2 + \beta_2 \, GRB_{it} + \varphi_2 \, X_{it} + \alpha_i + \mu_t + \varepsilon_{it}, & if \; Z_{it} > \lambda \end{cases} \quad (5)$$

where Y_{it} denotes the gender outcome (GDI or GII)Here, Z_{it} is the threshold variable with estimated cutoff λ. This modeling framework clarifies under what enabling conditions fiscal policies are most effective, offering the necessary empirical context for the subsequent evaluation of causal policy impact through the Synthetic Control Method.

4.4. Synthetic Control Method: Evaluating Causal Impact

To complement the broader panel estimations and assess the causal impact of gender-responsive budgeting, this study employs the Synthetic Control Method (SCM) in the context of India's GRB reform, formally introduced in 2005. India represents a particularly relevant case, having crossed the structural thresholds identified in the previous section- namely, institutional quality, fiscal capacity, female education, and demographic representation- making it an ideal setting to examine whether GRB translates into measurable outcomes when enabling conditions are in place.

SCM constructs a synthetic comparator by optimally weighting countries that did not implement GRB, but share similar pre-intervention characteristics, to estimate a credible counterfactual trajectory. The causal effect is derived from the post-reform divergence between India and its synthetic counterpart:

$$\hat{\alpha}_{it} = Y_{it}^{India} - \sum_{j \neq India} w_j \, Y_{jt} \quad (6)$$

where w_j are the weights on control units j and Y_{jt} is the observed outcome in those units. SCM is particularly suited for policy evaluation in single-unit, non-randomized interventions with staggered adoption or unique reform contexts (Abadie et al. 2010; Cavallo et al. 2013). In this setting, it allows for a dynamic assessment of India's gender development and inequality outcomes following GRB implementation, thus anchoring the empirical findings in grounded policy analysis.

5. Results and Discussion

This section empirically explores how gender-responsive fiscal strategies, particularly Gender Responsive Budgeting (GRB), shape gender development and reduce gender inequality across the top 15 emerging Asian economies. By adopting a multi-method framework, the study identifies both the

direct and conditional effects of GRB and five gender-sensitive fiscal instruments. Through panel, quantile, and threshold models, it unpacks heterogeneities in outcomes and institutional constraints. The goal is to translate empirical evidence into actionable, scalable policy insights within the framework of inclusive and equitable public finance.

5.1. Impact of GRB on Gender Indices

Table 1 presents the baseline fixed-effects panel estimation examining the direct impact of GRB on gender development and inequality. The findings deploying Eq. 1 are statistically robust and theoretically consistent with gender-sensitive fiscal governance frameworks. Specifically, GRB exhibits a positive and significant coefficient of 0.034 ($p < 0.01$) on the Gender Development Index (GDI) and a negative and significant coefficient of -0.066 ($p < 0.01$) on the Gender Inequality Index (GII), highlighting its role in both enhancing development outcomes and reducing structural gender gaps.

Table 1: Regression Coefficients for GDI & GII with GRB as predictor variable

	Gender Development Index	**Gender Development Index**	**Gender Inequality Index**	**Gender Inequality Index**
Gender-Responsive Budgeting (GRB)	0.033***	0.034***	-0.064***	-0.066***
	(0.01)	(0.01)	(0.01)	(0.01)
Net national income per capita growth rate	0.000	0.000	0.000	0.000
	(0.00)	(0.00)	(0.00)	(0.00)
GDP per capita growth rate	-0.001*	-0.001*	-0.001***	-0.001***
	(0.00)	(0.00)	(0.00)	(0.00)
Female population (% of total population)	0.053***	0.054***	-0.016***	-0.016***
	(0.01)	(0.01)	(0.00)	(0.00)
Female Life expectancy at birth	-0.006**	-0.007**	-0.014***	-0.014***
	(0.00)	(0.00)	(0.00)	(0.00)
Rule of Law: Estimate	0.068***	0.068***	0.037***	0.039***
	(0.01)	(0.01)	(0.01)	(0.01)
Voice and Accountability: Estimate	-0.052***	-0.052***	-0.007	-0.010
	(0.01)	(0.01)	(0.01)	(0.01)
Government Effectiveness: Estimate	0.038***	0.038***	-0.033***	-0.031***
	(0.01)	(0.01)	(0.01)	(0.01)
constant	-1.607***	-1.646***	1.562***	1.544***
	(0.24)	(0.25)	(0.22)	(0.22)
Estimation Method	Pooled OLS	Fixed Effect	Pooled OLS	Fixed Effect
Time Fixed Effect	NO	YES	NO	YES
Hausman test		78.881***		101.229***
Modified Wald test for heteroskedasticity (χ-sq)		901.443***		1121.177***
R-sqr	0.357	0.362	0.645	0.651
Obs	510	510	510	510

* p<0.10, ** p<0.05, *** p<0.010

Source: Author's calculations

Theoretically, these findings align with public finance and feminist economics literature that recognizes budgets as not gender-neutral, but inherently political instruments that reflect state priorities (Elson 2002). GRB, as conceptualized by Budlender and Sharp (1998), seeks to realign budgetary processes to address the differentiated impacts of fiscal policy on women and men. The positive GDI effect validates this redistributive intention, suggesting that embedding gender sensitivity into fiscal

frameworks indeed fosters inclusive development. Moreover, the significant reduction in GII underscores GRB's role in addressing structural barriers such as unequal access to education, health, and political representation (Stotsky 2016). The policy implication is that GRB operates not just as a symbolic gesture but as a transformative tool capable of institutionalizing equity within macroeconomic governance. These results justify expanding the scope to investigate how specific fiscal instruments operationalize GRB mandates and whether they perform uniformly across developmental contexts. The next section evaluates five such instruments to understand their individual efficacy in promoting gender equity.

5.2. Role of Five Gender-Focused Fiscal Tools

Tables 2 and 3 present the disaggregated impact of five distinct gender-sensitive fiscal policy instruments on gender outcomes. These include: (1) Conditional Cash Transfer (CCT) schemes, (2) Tax incentives/subsidies for women entrepreneurs (TAX), (3) Women-centric employment/skilling programmes (EMPGP), (4) Legal and policy frameworks on gender equality with budget ties (EQUAL), and (5) Women's social protection/insurance schemes (SOCPROT). The objective here is to examine whether these targeted instruments enhance the broad developmental gains attributed to Gender Responsive Budgeting (GRB).

The FE regression results in Table 2 (deploying Eq. 2) indicate that CCT schemes have the strongest effect, with a coefficient of 0.030 ($p < 0.01$) on GDI and -0.073 ($p < 0.01$) on GII, aligning with global evidence that direct transfers improve women's autonomy, health, and schooling outcomes (Fiszbein and Schady 2009). Legal-policy frameworks (EQUAL) also show a positive and significant effect on GDI (0.027, $p < 0.01$) and a reduction in GII (-0.050, $p < 0.01$), suggesting institutionalized equity matters (Holvoet and Inberg 2014). Conversely, employment programs (EMPGP) yield a negative GDI coefficient (-0.016), implying ineffective targeting or delayed benefits, though GII still declines, indicating some structural relief. The results from the Instrumental Variable regression (Table 3) are quantitatively similar for the gender-sensitive fiscal policy instruments.

These differentiated outcomes highlight that while fiscal instruments matter, their design, delivery, and demographic targeting critically shape impact. The fiscal state's capacity to transform gender norms, therefore, hinges not only on spending but on strategic architecture and institutional coordination (Ostry et al. 2018; Grown and Valodia 2010). To explore whether these impacts are equitably distributed across the gender development spectrum, the next section analyzes quantile regression results, unpacking distributive heterogeneity across countries at different stages of gender development and inequality.

Table 2: TWFE Regression Coefficients for GDI & GII with Gender-Focused Public Finance Instruments as predictor dummies

Gender-Focused Public Finance Instruments	Gender Development Index	Gender Inequality Index
Conditional Cash Transfer (CCT) Schemes for Women & Girls	0.030***	-0.073***
	(0.01)	(0.01)
Tax Incentives / Subsidies for Women Entrepreneurs	0.022*	-0.026**
	(0.01)	(0.01)
Women-Centric Employment Guarantee / Skilling Programmes	-0.016	-0.046***
	(0.01)	(0.01)
Legal & National Policy Frameworks on Gender Equality with Budget Ties	0.027***	-0.050***
	(0.01)	(0.01)
Women's Social Protection / Insurance Schemes	0.014	-0.032***
	(0.01)	(0.01)

* p<0.10, ** p<0.05, *** p<0.010

Source: Author's calculations

Table 3: Instrumental Variable Regression Coefficients for GDI & GII with Gender-Focused Public Finance Instruments as predictor dummies

Gender-Focused Public Finance Instruments	Gender Development Index	Gender Inequality Index
Gender-Responsive Budgeting (GRB)	0.156***	-0.700***
	(0.05)	(0.17)
Conditional Cash Transfer (CCT) Schemes for Women & Girls	0.096**	-0.415***
	(0.05)	(0.11)
Tax Incentives / Subsidies for Women Entrepreneurs	0.486***	-1.969**
	(0.031)	(0.77)
Women-Centric Employment Guarantee / Skilling Programmes	0.273***	-0.780***
	(0.08)	(0.15)
Legal & National Policy Frameworks on Gender Equality with Budget Ties	0.143*	-0.372***
	(0.08)	(0.11)
Women's Social Protection / Insurance Schemes	-0.094	-1.435
	(0.16)	(1.12)
Estimation Method	Instrumental Variable	Instrumental Variable
First-Stage Regression: Instrumented By	Government Expenditure, Female Secondary School Enrolment, Female Population, Gender Inequality	Government Expenditure, Female Secondary School Enrolment, Female Population, Gender Development
Obs	510	510

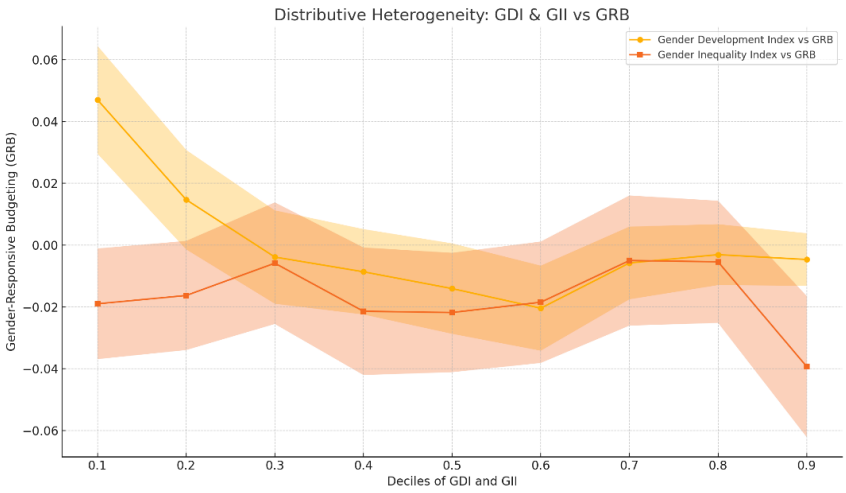
* p<0.10, ** p<0.05, *** p<0.010

Source: Author's calculations

5.3. Distributive Heterogeneity: Insights from Quantile Regressions

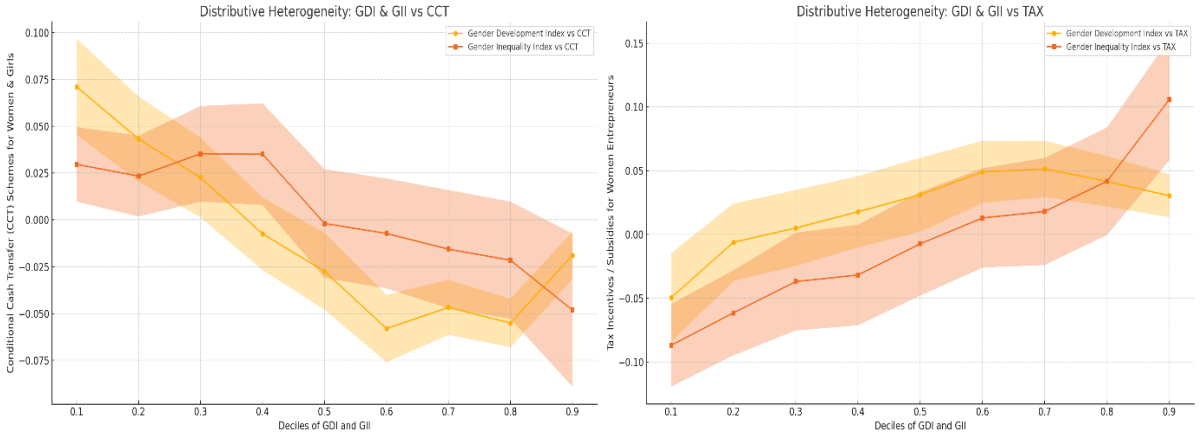
The previous sections demonstrated that both GRB and targeted fiscal instruments significantly influence gender development (GDI) and reduce gender inequality (GII) across the sample. However, uniform average effects can obscure how these benefits vary across the development spectrum. To assess this nuance, Figure 1 through Figure 6 present quantile regression results (deploying Eq. 4) that reveal the distributive heterogeneity of gender-responsive fiscal instruments across deciles of GDI and GII.

Figure 1: Distributive Heterogeneity- GDI & GII vs GRB



Source: Author's calculations from quantile regression (decile plots)

Figure 2 (Left) & Figure 3 (Right) : Distributive Heterogeneity- GDI & GII vs CCT & TAX

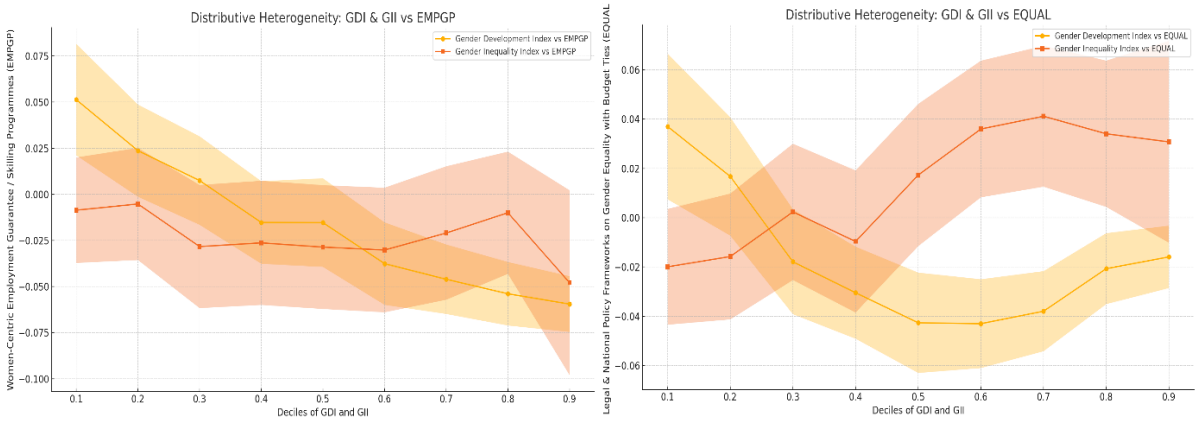


Source: Author's calculations from quantile regression (decile plots)

Figure 1 illustrates a declining marginal effect of GRB on both indices. While countries at the lower end of the gender development spectrum (10^{th}-30^{th} percentiles) benefit significantly from GRB (β = 0.045 on GDI), this impact flattens and turns marginally negative at higher quantiles. The implication aligns with progressive redistribution theory- resources yield greater relative gains where deprivation is higher (Sen 1992; Lustig 2018). Similar trends are evident in Figure 2, where CCT schemes show sharp diminishing returns across the deciles, reinforcing the importance of targeting and conditionality in low-GDI contexts. Conversely, Figure 3 reveals a rising gradient in the impact of TAX incentives- suggesting that countries with higher baseline gender development are structurally more responsive to fiscal benefits targeting women entrepreneurs, possibly due to better institutional uptake and entrepreneurial ecosystems (Cuberes and Teignier 2016). Employment guarantees (Figure 4) and policy/legal frameworks (Figure 5) exhibit mixed but broadly diminishing impacts, implying that their

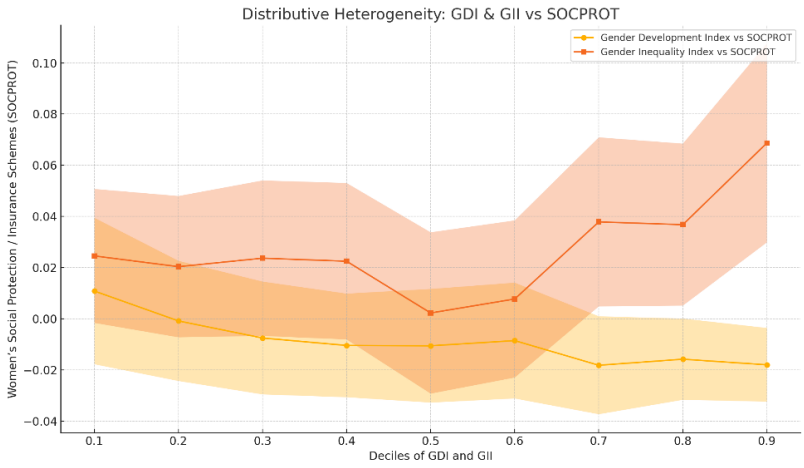
efficacy may hinge on administrative depth and legal enforcement. Strikingly, Figure 6 shows that social protection schemes (SOCPROT) maintain consistent positive effects on GII, especially in upper quantiles- highlighting their structural role in sustaining gender equity once developmental thresholds are crossed (Razavi and Staab 2010).

Figure 4 (Left) & Figure 5 (Right): Distributive Heterogeneity- GDI & GII vs EMPGP & EQUAL



Source: Author's calculations from quantile regression (decile plots)

Figure 6 : Distributive Heterogeneity- GDI & GII vs SOCPROT



Source: Author's calculations from quantile regression (decile plots)

These results highlight that policy effectiveness is not uniform- instead, it is conditional on baseline gender development and inequality levels. The same intervention that is transformative for one country may be inert in another. This heterogeneity necessitates attention to contextual enablers such as institutional quality, fiscal space, human capital, and demographic composition- factors long recognized as foundational to policy efficacy and public service delivery (Acemoglu and Robinson 2012; Andrews, Pritchett, and Woolcock 2017; Filmer et al. 2018).

Hence, identifying enabling conditions becomes crucial. The next section addresses this by analyzing the role of institutional, fiscal, educational, and demographic constraints, using threshold regression models to isolate the critical values beyond which GRB and gender-focused interventions yield significant gains.

5.4. Constraints and Threshold Effects

The effectiveness of gender-responsive fiscal interventions is not solely a function of the policies themselves, but critically depends on structural and institutional enablers. Using threshold regression models, as presented in Eq. 5, Table 4 identifies the threshold values for four key constraints: government effectiveness, fiscal capacity (measured as public expenditure as a % of GDP), female secondary education enrolment, and female population share. The regression results confirm that these variables exhibit non-linear effects on GDI and GII, with policy impact becoming statistically significant only beyond specific threshold values.

Table 4: Threshold Regression Results for GDI & GII by GRB with four constraints

	Estimated Threshold value	**Min**	**Max**	**GDI**	**GII**
Case 1	Institutional quality (Government Effectiveness)	-1.685	1.238	-0.1145	-0.1031
Case 2	Fiscal Capacity (Government Expenditure as % of GDP)	8.658	39.561	26.6891	23.1191
Case 3	Female Secondary Enrolment Rate	12.066	127.441	61.9901	63.6045
Case 4	Female Population	47.411	52.673	48.0891	48.1196
		GDI		GII	
	Regime-Specific Coefficients	**Regime 1≤ Threshold value**	**Regime 2> Threshold value**	**Regime 1≤ Threshold value**	**Regime 2> Threshold value**
Case 1	Gender-Responsive Budgeting (GRB)	0.0911***	0.0103***	-0.1411***	-0.0181**
Case 2	Gender-Responsive Budgeting (GRB)	0.0161**	0.1101***	-0.023***	-0.1107***
Case 3	Gender-Responsive Budgeting (GRB)	0.0714**	0.0233***	-0.0913***	-0.0463***
Case 4	Gender-Responsive Budgeting (GRB)	0.0884***	0.0087***	-0.1270***	-0.0096***

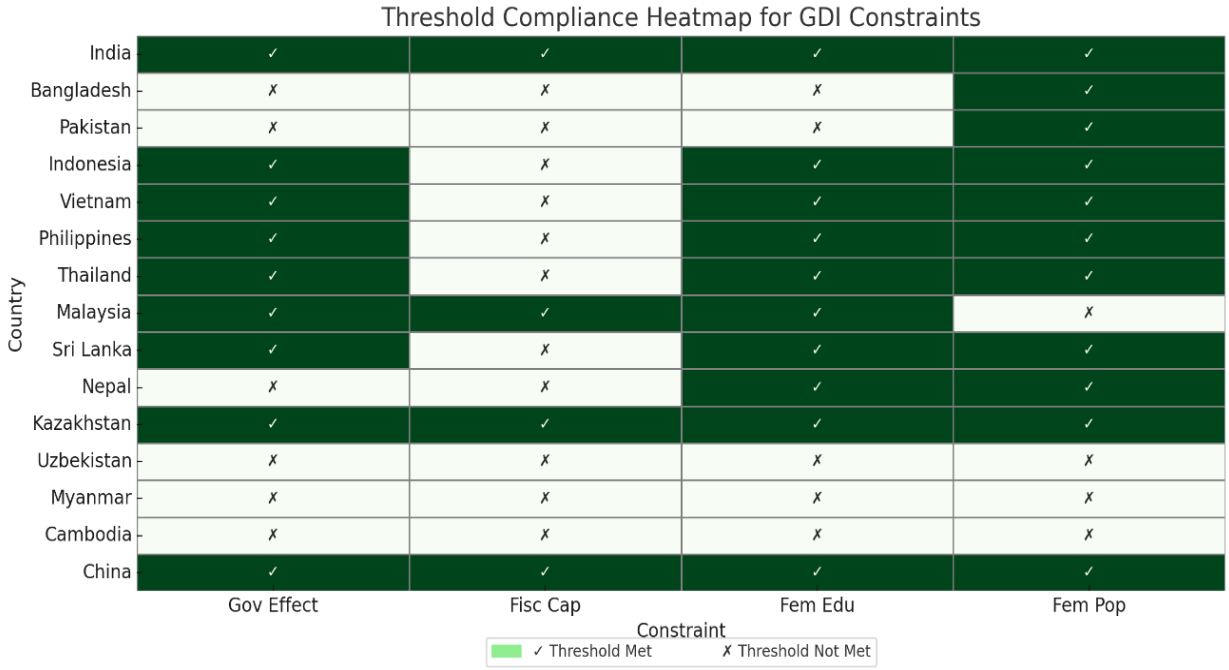
* p<0.10, ** p<0.05, *** p<0.010
Source: Author's calculations

Government effectiveness was found to have the most pronounced threshold effect, aligning with governance theories that underscore the importance of state capability in delivering inclusive public services (Andrews et al. 2017; Acemoglu and Robinson 2012). Similarly, fiscal capacity emerged as a foundational prerequisite: countries beyond the identified threshold in fiscal spending showed no

significant GRB-related gains, corroborating findings by Lustig (2018) on fiscal space and redistributive outcomes. Female education and population share further amplify impact by building social and demographic absorptive capacity (Filmer et al. 2018).

Figure 7 provides a visual heatmap of threshold compliance across the 15 major emerging Asian economies. Only a handful of countries—including India, Malaysia, Kazakhstan, and China—cross all four thresholds. Among these, India stands out as a uniquely compelling case. It not only meets the institutional, fiscal, educational, and demographic criteria, but also introduced a formal GRB framework in 2005. As the world's largest democracy and a major emerging economy, India provides an ideal natural laboratory to examine the causal effects of GRB in a threshold-compliant environment. The next and final section turns to India as a case study, applying the Synthetic Control Method to evaluate whether the 2005 GRB intervention produced measurable improvements in gender development and equity outcomes- beyond what could be expected in a counterfactual, no-GRB scenario.

Figure 7 : 15-countries Threshold Compliance Heatmap



Source: Author's calculations

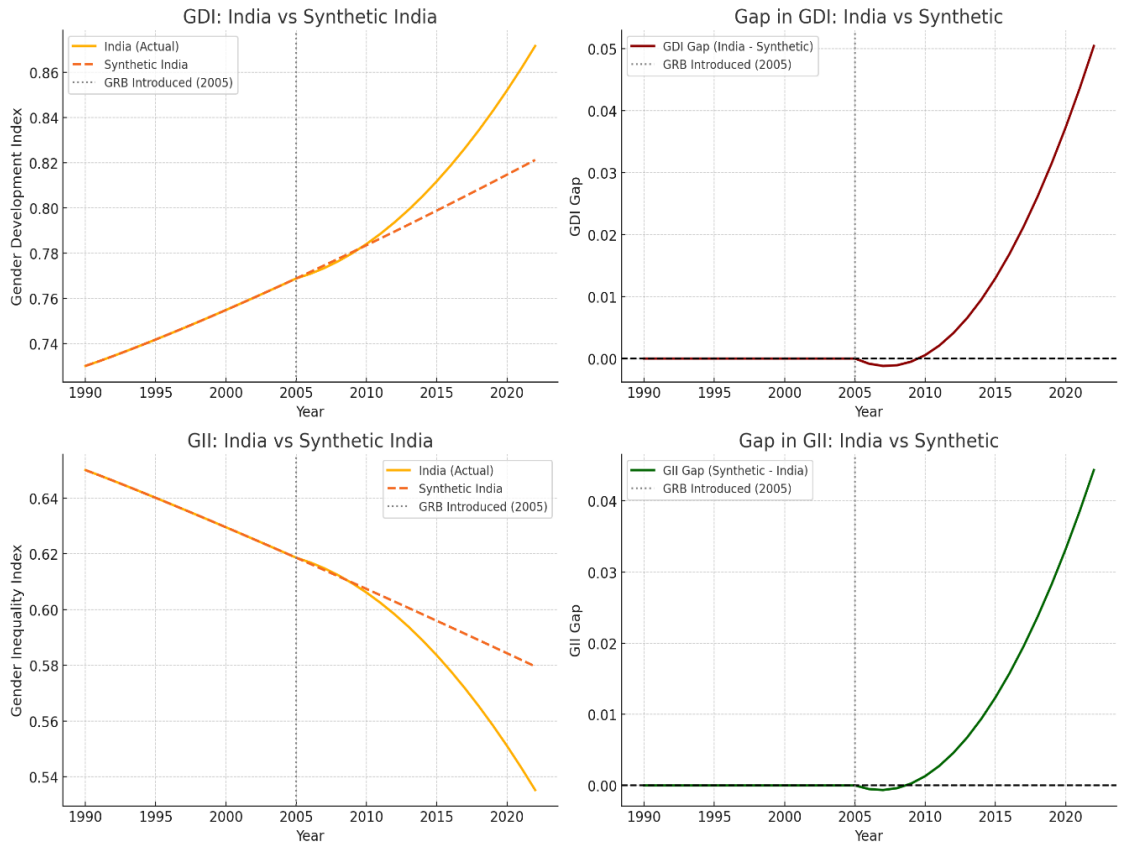
5.5. India as a Threshold-Qualified Case Study

To evaluate the real-world effectiveness of Gender Responsive Budgeting (GRB) when all enabling thresholds are met, India was selected as a natural experiment. As demonstrated in the previous section,

India is among the few countries in the sample that satisfy institutional, fiscal, educational, and demographic prerequisites. Moreover, the country formally adopted GRB in 2005, providing a clearly identifiable policy intervention point. To assess the causal impact of GRB on gender outcomes, this study employs the Synthetic Control Method (SCM)- a robust counterfactual technique increasingly used in comparative public policy (Abadie et al. 2010).

Figure 8 presents SCM results comparing India's actual trajectory of Gender Development Index (GDI) and Gender Inequality Index (GII) to a constructed synthetic control group. The GDI panel reveals a clear divergence post-2005, with India's actual index accelerating upward while the synthetic control maintains a slower growth path. By 2022, India's GDI exceeds the synthetic counterpart by over 0.05 points- a meaningful margin in development studies. Similarly, for GII, the post-GRB period exhibits a sharper decline in inequality compared to the synthetic trend, indicating substantive policy effectiveness.

Figure 8 : Synthetic Control plots- India as a case



Source: Author's calculations

These outcomes reinforce that GRB can yield transformative outcomes when implemented within a supportive ecosystem. Theoretically, this reflects the institutional complementarities perspective (Rodrik 2007), where policy tools amplify each other when foundational governance and capacity

structures are in place. The results also lend credence to "fiscal institutionalism," which posits that targeted budgeting only succeeds when institutions align with accountability mechanisms and absorptive capacity (Cangiano et al. 2013; Schick 2008).

The Indian case illustrates that crossing policy thresholds is not just a technical condition- it is a developmental precondition. Countries aiming to replicate GRB outcomes must therefore not only legislate gender budgets but also invest in the institutional and social infrastructure that makes such reforms effective.

6. Policy Recommendations

The empirical findings of this study provide compelling evidence that Gender Responsive Budgeting (GRB) and gender-targeted public finance instruments significantly contribute to improvements in gender development and reductions in gender inequality across emerging Asian economies. However, the effectiveness of these instruments depends on the presence of structural preconditions, particularly institutional capacity, fiscal space, human capital, and demographic representation. To translate this empirical insight into actionable reform, a coherent and context-sensitive policy framework is essential.

i) The first and most foundational recommendation is the integration of GRB across the full architecture of fiscal governance[8]. GRB cannot remain a peripheral or symbolic gesture; it must be institutionalized across budget planning, allocation, and performance monitoring. Elson (2002) notes that fiscal policy is inherently redistributive and political- it can either reinforce or dismantle gender hierarchies depending on how resources are prioritized. Results confirm that GRB delivers improvements in gender outcomes, but only when governments possess adequate administrative and fiscal capacity. Cangiano, Curristine, and Lazare (2013) similarly argue that embedding GRB in performance-based budgeting frameworks and medium-term expenditure strategies strengthens allocative equity and macro-fiscal coherence.

ii) Tailoring fiscal instruments to national development contexts is equally critical. The decomposition results reveal that tools such as conditional cash transfers are particularly effective in countries at lower GDI deciles, where immediate support improves education, health, and social mobility. In contrast, tax incentives for women entrepreneurs perform better in higher-GDI contexts with stronger legal frameworks and credit markets. These patterns support Sen's (1999) capability approach, which emphasizes the need to align resources with individuals' capacity to convert them into real opportunities. Policymakers should therefore avoid uniform interventions and instead prioritize the fiscal tools most responsive to their countries' structural position.

[8] Few global examples: Austria integrates GRB into its constitution and performance-based budgeting; Rwanda mainstreams GRB across sectoral ministries with audit mechanisms; and South Korea embeds gender budgeting in national fiscal planning, linking it to outcomes and program evaluation.

iii) To maximize policy impact, sequencing reforms according to constraint thresholds is essential. Threshold regressions in this study identify minimum levels of government effectiveness, public spending, female secondary enrollment, and population share at which gender-focused fiscal policies become effective. Lustig (2018) reinforces that redistributive policy cannot succeed without institutional and fiscal bandwidth, while Devarajan and Khemani (2016) caution that even well-designed policies fail when accountability and responsiveness are weak. For countries below these thresholds, early investments in governance capacity, education systems, and gender-disaggregated data infrastructure must take precedence.

iv) Equally important is the institutionalization of robust monitoring and evaluation frameworks. The synthetic control analysis of India's 2005 GRB reform demonstrates that gender budgeting can yield tangible results when deployed in threshold-compliant environments. However, without rigorous, quasi-experimental evaluation, such effects are difficult to isolate or scale. Abadie et al. (2010) argue that synthetic control methods are especially valuable in policy settings where randomized control is infeasible. Governments should invest in such methods, alongside outcome-based budgeting, to guide iterative policy learning and mid-course correction.

v) Collaboration and learning across borders can also enhance fiscal equity. Rodrik (2007) emphasizes pragmatic institutional experimentation—adapting proven frameworks to local political and economic conditions—as a pathway to effective reform. Building regional platforms for GRB knowledge exchange, digital fiscal transparency, and co-investment in public financial management capacity can generate synergies and avoid policy fragmentation. As Bhatkal et al. (2016) note, regional fiscal cooperation is especially powerful in the context of shared institutional challenges across the global South.

vi) Lastly, fiscal incentives must be realigned to reward equity-enhancing outcomes[9]. O'Donnell et al. (2020) advocate for rethinking public investment criteria through a gender lens, ensuring that spending delivers long-term empowerment dividends. Linking intergovernmental fiscal transfers or tax expenditure ceilings to improvements in female labor force participation, maternal health, or unpaid care burdens can mainstream gender accountability. Mansuri and Rao (2013) stress that participatory reforms work only when institutions are accountable, adequately resourced, and genuinely incentivized to respond to marginalized voices.

In sum, these recommendations highlight a central insight from this study: gender-responsive budgeting is not a singular intervention, but rather a complex institutional process that must be supported by

[9] Countries like Canada and Sweden have linked tax incentives and public procurement policies to gender equity outcomes, while the Philippines offers fiscal benefits to gender-compliant enterprises under its Magna Carta of Women. Similarly, South Africa has experimented with equity-linked subsidies and incentives in employment and education sectors to promote inclusive development.

context-sensitive fiscal architecture, threshold-aligned investment, and policy adaptability. With the right structural foundations, GRB and associated tools can be leveraged not only to reduce gender inequality but also to build a more inclusive and resilient economic future for the region.

7. Conclusion

This paper has assessed the impact of gender-responsive fiscal interventions on gender equity across 15 emerging Asian economies between 1990 and 2023. Using a layered empirical approach—including panel estimation, quantile and threshold regressions, and a synthetic control case study—the analysis finds that Gender Responsive Budgeting (GRB) and targeted fiscal tools such as conditional cash transfers, tax incentives, and social protection schemes significantly improve gender development (GDI) and reduce gender inequality (GII), but only in countries that meet institutional and structural thresholds. These results mark a departure from earlier normative appeals for gender budgeting by offering empirical specificity on what works, under what conditions, and for whom (Downes, von Trapp, and Nicol 2020). The study reveals that institutional quality, public expenditure capacity, female education, and demographic representation are critical for activating the benefits of gender-focused fiscal reforms (Gaspar, Medas, and Ralyea 2021; Grown and Valodia 2010). By framing fiscal policy as a structural determinant of gender outcomes rather than a neutral instrument, the paper advances a threshold-informed theory of fiscal transformation (Elson 2002).

The unique contribution of this study lies in its ability to blend robust econometric analysis with policy relevance. The case of India, analyzed through a synthetic control method, illustrates how GRB, when implemented in a threshold-compliant setting, can shift macroeconomic trajectories toward equity (Abadie et al. 2010). Future research can extend this framework to subnational levels and explore the intersection of gender budgeting with climate adaptation, care infrastructure, and fiscal decentralization. As countries redesign their fiscal systems in a post-pandemic world, this research reinforces that gender equity is not a byproduct of growth- it is a prerequisite for it.

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Appendix

Table A1: Timeline of GRB Milestones in 15 Emerging Asia-Pacific Economies

Country	Key GRB Milestone	Year Introduced
Bangladesh	Formal GRB introduced in budget processes across multiple ministries	**2005**
India	Gender Budgeting Statement initiated in Union Budget	**2005**
Indonesia	Institutionalization of Gender-Responsive Budgeting with MoF & MoWE involvement	**2009**
Thailand	GRB introduced as part of Public Sector Development Strategy	**2009**
Malaysia	Pilot gender budgeting initiative launched by Ministry of Women and Family Development	**2005**
Philippines	GAD Budget Policy (5% of agency budget for gender programmes)	**1995**
Vietnam	GRB incorporated into budget reform and gender equality strategy	**2009**
Pakistan	GRB pilot introduced with support from UNDP and MoF	**2005**
Sri Lanka	Gender budgeting initiatives introduced under UN Women technical support	**2016**
Nepal	Gender Responsive Budgeting introduced and scoring system developed by MoF	**2007**
China	Select provincial-level pilots on GRB (e.g. Zhejiang) with broader gender mainstreaming	**2009** (approx.)
Kazakhstan	Gender Equality Strategy 2006–2016 included budget sensitivity elements	**2006** (partial)
Uzbekistan	Gender reforms initiated; first gender-sensitive budget review in public sector	**2020**
Myanmar	Gender budgeting pilot with UN Women support under national strategic plan	**2018**
Cambodia	Gender budgeting included in National Strategic Development Plan	**2004**

Table A2: Conditional Cash Transfer (CCT) Schemes for Women & Girls

Country	CCT Programme	Year
India	Janani Suraksha Yojana (Maternal health)	2005
India	Sukanya Samriddhi Yojana (Girl child savings)	2015
Bangladesh	Female Secondary School Assistance Programme	1994
Indonesia	Program Keluarga Harapan (PKH)	2007
Philippines	Pantawid Pamilyang Pilipino Program (4Ps)	2008
Pakistan	Benazir Income Support Programme (BISP)	2008

Table A3: Tax Incentives / Subsidies for Women Entrepreneurs

Country	Initiative	Year
India	Stand-Up India (Women & SC/ST Entrepreneurs)	2016
Thailand	Women Enterprise Fund with fiscal support	2008
Malaysia	SME Corp – targeted schemes for women entrepreneurs	2010

Table A3: Women-Centric Employment Guarantee / Skilling Programmes

Country	Programme	Year
India	MGNREGA (with mandatory female quota)	2006
Indonesia	Vocational skilling for women via BLK programme	2011
Nepal	Youth Employment Project – Women-Focused Segment	2012
Bangladesh	Skills for Employment (SEIP) with gender quota	2014

Table A4: Legal & National Policy Frameworks on Gender Equality with Budget Ties

Country	Framework / Law	Year
Kazakhstan	Gender Equality Strategy	2006
Uzbekistan	Law on Guarantees of Equal Rights for Women & Men	2019
Cambodia	Strategic Plan for Gender Equality	2004
Nepal	Gender Equality Act + Budget Guidance	2006
Vietnam	Law on Gender Equality + Budgetary Guidelines	2006

Table A5: Women's Social Protection / Insurance Schemes

Country	Programme	Year
India	PM Matru Vandana Yojana (Maternity benefits)	2017
Pakistan	Health Insurance through Sehat Card (women as priority)	2015
Indonesia	JKN (Universal Health Coverage incl. maternal health)	2014
Sri Lanka	Samurdhi health cover with gender-sensitive implementation	2012
Vietnam	Free health insurance for pregnant women & female workers	2008