A Panel Study on Fiscal Policy and Gender Inequality: Efficacy of Gender Budgeting in Asia Pacific Countries

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Abstract

Gender budgeting is a fiscal policy measure that seeks to use a country's national and/or local budget(s) to reduce inequality and promote economic growth and equitable development. While literature has explored the connection between reducing gender inequality and achieving growth and equitable development, more empirical analysis is needed to determine whether gender budgeting really curbs gender inequality. This study follows the methodology of Stotsky and Zaman (2016) to investigate across Asia Pacific countries the impact of gender budgeting on promoting gender equality, and also increasing fiscal spending on health and education. The study classifies Asia Pacific countries as 'gender budgeting' or 'non-gender budgeting' according to whether they have formalized gender budgeting initiatives in laws and/or budget call circulars. To measure the effect of gender budgeting on reducing inequality, we measure the correlation between gender budgeting and the Gender Development Index (GDI) and Gender Inequality Index (GII) scores in each country. The data for gender inequality variables are mainly drawn from the IMF Database on gender indicators and the World Development Indicators database, over 1990-2013. Result shows that gender budgeting has significant effect on increasing GDI and small but significant potential to reduce GII. These results strengthen the rationale for employing gender budgeting to promote inclusive development. However, study results show no prioritization for gender budgeting in the fiscal space of health and education sectors in the region.

Keywords: *Gender Budgeting, Fiscal Policy, Gender Equality, Asia Pacific*

Introduction

Gender budgeting is a fiscal policy measure that seeks to use a country's national and/ or local budget(s) as a tool to resolve societal gender inequality and promote inclusive development. Gender budgeting does not involve the creation of separate budgets for men and women. Instead, it involves studying a budget's differing impacts on men and women so as to set new allocations and revenue policies to promote greater efficiency and equity as regards gender equality (Chinkin, 2001; Stotsky, 2016). Ideally, gender budgeting is an approach to fiscal policies and administration that translates gender-related commitments into fiscal commitments through identified processes, resources, and institutional mechanisms, impacting both the spending and revenue sides of the budget (Chakraborty, 2014).

More than 90 governments around the world, a quarter of which are in Asia, are pursuing gender budgeting (Budlender, 2015). The literature outlines two overarching primary motivations for gender budgeting: its perceived positive impacts on economic efficiency, growth, and productivity, as well as its positive impacts

on equity in terms of both inclusive development and equal realization of human rights. The basic argument underlying both the efficiency/growth motivation and the equity motivation for gender budgeting is that, first, gender budgeting reduces gender inequality, which, sec-ond, causes growth, more equitable development of women and society generally, and equal achieve-ment of human rights.

The co-relations in the second part of the argument, between reducing gender inequality and promoting growth and women's advancement, have been explored extensively in the literature. The exact causal relationship between gender inequality and growth is a bit unclear, with evidence at once suggesting that reducing inequality is the precursor to growth, that growth is in fact the precursor to reducing inequality, and even, concerningly, that maintaining inequality can yield growth (Cuberes and Teignier, 2014). However, there is certainly strong evidence that gender budgeting can indirectly raise equitable growth through its impact on fiscal policies (Stotsky, 2016; Kabeer and Natali, 2013). It is more assuredly found that reducing gender inequality promotes inclusive and equitable development, advancement of women and societies, and achievement of human rights (World Bank, 2011).

The co-relation in the first part of the argument, however – that gender budgeting actually reduces gender inequality – has been less clearly affirmed. As Stotsky (2016) has observed, there have been few efforts to assess the results of gender budgeting in a quantitative manner. Stotsky asks whether the practice of gender budgeting has yielded greater gender equality in school enrolment (as a proxy for gender equality) and increased spending on social services, education, health, welfare, and infra-structure, in Indian states. Yet most other studies evaluating the success of gender budgeting initiatives tend to focus on the success of their implementation; that is, whether governments are following the steps of gender budgeting, rather than their impact in achieving their goals of equality, growth, inclusive development, and human rights (e.g. Nakray, 2009; Mushi and Edward, 2010).

This study seeks to extend work taken up by Stotsky in India, to evaluate across a data set of Asia-Pacific countries the impact of gender budgeting on gender equality and fiscal spending. We use the Gender Development Index and Gender Inequality Index as proxies for gender equality. We also measure the impact of fiscal spending on gender development on the assumption that higher spend-ing in these areas yields better outcomes for inclusive development (Lahiri et al., 2002). We show that gender budgeting matters for improving gender development indices.

In addition to the core analysis on the impact of gender budgeting on gender equality and fiscal spending in Asian countries, we also briefly observe differences between the covered countries in terms of both the formality of their approach to gender budgeting, and their legal climate as regards gender equality more broadly. Gender budgeting may be undertaken at an impermanent policy level, or it may be formalized into the budget process through incorporation into budget circulars and gender budgeting statements, or even into law. This study notes differences in the degree or method of formalization of the gender budgeting initiative in each country studied. The authors are also pre-paring a further study on whether formalization of budgeting, and in what form, is linked to better outcomes in equality and spending. This study, similarly, identifies in the Appendix, key economic and social laws advancing gender equality that have, or have not, been enacted across the countries studied. The authors' study will additionally explore what, if any, is the nexus between these laws and gender budgeting, to elucidate whether, how, and why a country's legal climate for gender equality impacts its decision to pursue gender budgeting, its gender budgeting implementation method, and the results of its gender budgeting program.

The remainder of the paper is organized in the following manner. Section II surveys literature exploring the relationship between gender inequality and a) efficiency, productivity, and growth, b) equity in terms of inclusive development, and c) equity in terms of equal realization of human rights. This section also surveys literature on public fiscal policies, and assesses gaps in the literature evaluating the link between gender budgeting and outcomes in equality and spending. Section III provides an overview of which Asian countries are pursuing gender budgeting, and through what means. Section IV discusses the empirical approach and provides econometric model and results. Section V offers concluding remarks and implications for policy on gender budgeting.

Literature Review

Our analysis of the effectiveness of gender budgeting in Asia begins with a survey of the literature outlining what exactly, do we mean by gender budgeting approach. Scholars and governments alike typically name two overarching primary motivations for gender budgeting: its perceived positive impacts on economic efficiency, growth, and productivity, as well as its positive impacts on equity in terms of both inclusive development and equal realization of human rights. The arguments encouraging gender budgeting tend to proceed in two steps: first, that gender budgeting reduces gender in-equality; and second, that reduction in gender inequality in turn leads to positive outcomes in efficiency and equity.

One primary motivation for gender budgeting is its perceived impact on growth. Growth is often cited as an outcome of reducing gender inequality, which serves to close inefficient gender gaps in workforce participation, education, and health (Berik et al., 2009; Hill and King, 1995; Dollar and Gatti, 1999; Klasen, 2002; Knowles et al., 2002; Esteve-Volart, 2004). However, as many scholars point out, pinning the direction of causality between growth and reduction of gender inequality is tricky, and indeed inequality itself (and not its reduction) has been found to cause growth (Stotsky, 2016; Cuberes and Teignier, 2014).

As per (IMF, 2015), fiscal reform policies influence growth by increasing workforce participation, encouraging personal and state investment, strengthening human capital, and raising total factor productivity. The study argues that reducing gender inequality sparks growth, typically focuses on the first three IMF growth factors. Discussing labour force participation, for example, Aguirre et al. (2012) posit that raising female labour force participation to match country-specific male levels could raise GDP by percentage points ranging from 5% in the United States to 34% in Egypt. Cuberes and Teignier (2012) suggest that GDP per capita losses resulting from gender gaps in the labour market may be as high as 27% for some regions. The World Bank (2011) posits that "[e]specifically in countries with a comparative advantage in female goods, gender differences in access to market work and persistent employment segregation by gender could severely undermine the country's capacity to compete internationally and ultimately hamper economic growth." Considering the second factor of personal investment, ensuring women equal property rights, for example, is seen

as an important tool to help women receive credit to fund new small businesses (World Bank, 2011). Strengthening women's property rights can also increase households' agricultural production through causing more efficient sharing of resources between men to women (Udry, 1996). Finally, considering the factor of human capital, Klasen (1999) argues that a failure to provide women equal access to education and to utilize their talents equally is a form of market distortion or restriction on the human capital productivity of an economy. Kabeer and Natali (2013) also note that the demonstrated propensity of women to invest more, comparative to men, in the human capital of their children has a long-term positive impact on growth.

But Bandiera and Natraj (2013) assert that the empirical research has yet to identify the causal link from inequality to growth, and Cuberes and Teignier (2014) survey theoretical and empirical studies that assert a causal chain going either one way, or the other way, or indeed both ways between gender inequality and growth. Indeed, Berik (2009) says that the "contradictory" evidence gives "rise to an important debate on whether the net effect of gender inequality is a stimulus or a drag on growth." For example, Seguino's research (2008) on semi-industrialized nations has shown that women's comparatively low wages in low-skilled export industries such as textiles have been a leading factor in helping governments attract foreign direct investment and build their export economy. This inequality has been an impetus for trade and growth. Berik (2009) also observes that women's seasonal and daily wage labour in agricultural industries has in some economies helped keep food production costs low and exports high, to positively impact GDP.

What seems most likely is that the causality, in fact, run in both directions, yielding the practical wisdom that it is worth pursuing efforts geared towards both growth and inequality reduction. To the extent that inequality itself yields growth, that is a reminder to policy makers that there are other reasons than growth, namely equity, to pursue inequality reduction.

A second primary motivation for gender budgeting is its perceived potential to promote equitable development, distinct from economic growth. There are two facets to this motivation: at a basic level, since women and girls tend to suffer greater disadvantage across a range of social and economic

indicators, therefore alleviating these development disparities through gender budgeting programmes is a valid development end in itself. Secondly, policy makers and academics have long highlighted the value of gender equality as a precursor to, or tool for promoting, economic development more broadly (World Bank, 2011).

Women and girls face significant social and economic disadvantage vis-à-vis men and boys, including higher mortality rates than men in low and middle-income countries, segregation into lower-paid and lower-skilled employment sectors, greater responsibilities in the care economy, lower levels of education, political participation, land ownership, and credit, and less power in household as well as community and national decision-making (World Bank 2011). Recognizing these gendered development disparities, the international community has, in 2000 with the adoption of the Millennium Development Goals (MDGs) and again in 2015, with the adoption of the Sustainable Development Goals (SDGs), identified promotion of gender equality and empowerment of women and girls as a development goal in and of itself. Literature on gender budgeting often posits advancement of gender equality and women's and girl's development as a motivation for gender budgeting (Stotsky, 2016; Sharp and Elson, 2008). Moreover, governments adopting gender budgeting also highlight amelioration of gender disparities and empowerment of women as the key motivation. For example, in Asia, the Indian, South Korean, and Afghan gender budgeting initiatives all posit women's advancement as the motivator for their programmes (Chakraborty 2016; Kolovich and Shibuya, 2016).

In addition to pursuing gender equality and development of women and girls for their own sake, these goals are also discussed as a means to development overall (Stotsky, 2016). In 2005, the UN Department of Economic and Social Affairs called gender equality and women's empowerment a "prerequisite" to achieving the other MDGs, and in 2011, the World Bank asserted that "[g]ender equality matters also as an instrument for development" (United Nations, 2005; World Bank 2011).

As discussed under the section on growth, a primary aspect of this argument is that the development of women yields both immediate and long-term benefits for their children and for society. The World Bank (2011) identifies several studies discussing these linkages. For example, in China, increasing women's income by 10% of the average household income correspondingly increased by one percent the survival of girl children and increased years of schooling for girls and boys (Qian, 2008). In Pakistan, a study found that children whose mothers attended even one year of school spend an hour more on educating themselves each day, and have higher test scores (Andrabi et al., 2011). Greater land rights of mothers in Nepal have been linked to stronger health of children (Allendorf, 2007). Greater representation of women in local government in India has yielded increased provision of public goods desired by both men and women (Chattopadhyay et al. 2004). In India and Nepal, giving women a greater role in management of forests has led to significantly stronger conservation results (Agarwal, 2010; Agarwal, 2010). To the extent then that gender budgeting promotes women's advancement, it is argued to have a second trickle-down effect in advancing children, households, and society at large.

The third primary motivation for gender budgeting, also grounded in equity, is the achievement of women's equality and human rights. Scholars of gender budgeting argue that gender budgeting advances human rights in a few ways. First, the practice of gender budgeting helps governments to fulfil their international legal obligations to seek gender equality and equal realization of human rights within their states. Second, by helping states promote women's development and equal rights, gender budgeting can help women actually achieve those rights. And third, the process of gender budgeting, including the collection and evaluation of sex-disaggregated social and economic data and the study of challenges facing women, can encourage countries to promote the rights of women through new internal laws.

Several international human rights conventions establish equality between men and women including with respect to the enjoyment of numerous human rights. The International Covenant on Civil and Political Rights (ICCPR) and the International Covenant on Economic, Social and Cultural Rights (ICESCR), which both entered into force in 1976, assert that the right of men and women to benefit equally from the civil, political, economic, social, and cultural human rights outlined in the conventions. In 1979, the United Nations General Assembly adopted

the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW), which focuses specifically on ensuring equal human rights for women and relies on the first two conventions for its definitions of basic human rights.

Elson (2006) has taken the lead in demonstrating how gender budgeting can help governments meet their treaty obligations to ensure gender equality. Elson provides a helpful overview of how human rights are relevant to budgets, focusing on CEDAW. She notes that CEDAW does not include provisions on budgeting, but requires states, party to the convention, to ensure equal rights (including both political and economic/social rights) for women. Key principles championed by CEDAW and highlighted by Elson are formal and substantive equality between men and women, non-discrimination against women, equal right of women to participation in public and political life, and modification of social and cultural patterns of conduct to eliminate discrimination against women. By pursuing gender budgeting to rectify inequality between the sexes particularly under the government's own fiscal policy, governments can turn their legal obligations into practical action.

By the same token, gender budgeting employed by a government can help women actually achieve their internationally recognized human rights. Human rights in the ICESCR are particularly relevant for gender budgeting, including the rights to work, to just and fair conditions of work especially for women, to social security, to an adequate standard of living including food, clothing and housing, to the highest attainable standard of physical and mental health, and to education. As Elson (2006) notes, the budget regulates programmes related to all of these rights, and thus can have direct bearing on women's ability to achieve these rights equally to men.

Finally, the process of gender budgeting, as an element of gender mainstreaming, can have the positive externality of encouraging passage of domestic laws creating or enforcing rights for women. One base element of gender budgeting is the collection of sex-disaggregated statistics, and several countries have begun their gender budgeting efforts with a mandate for greater disaggregation of sector-specific statistics (Chakraborty, 2016; Kolovich and Shubuya, 2016). This sex-disaggregated data can be used to justify passage of laws addressing gender disparities, such as laws promoting women's health

and safety, access to education, equal rights to work, etc.

The literature surveyed above links gender inequality to arguments of efficiency and equity. It is still necessary to link gender budgeting to reduction in gender inequality. As Stotsky (2016) and Chakraborty (2016) observe, further research is needed to test empirically this first link in the chain. Some analysis has been done of gender budgeting's tangible impact on gender equality. For example, Chakraborty (2016) observes that the Indian government decided to transition from a method of earmarking funds for women to a more macro level of gender budgeting, because it found that the earmark approach did not in fact result in the full amount of funds earmarked reaching women. In the same study, Chakraborty also notes that provision of sex-disaggregated data in Pakistan has helped to increase hiring of women in the government sector, decrease the gender wage gap, and spearhead public funding of day care centers to lighten women's home care responsibilities. Stotsky (2016) analyzed whether the practice of gender budgeting has yielded greater gender equality in school enrollment (as a proxy for gender equality) and increased spending on social services, education, health, welfare, and infrastructure, in Indian states. She finds that gender equality in school enrollment at least at the primary level is improved significantly in Indian states practicing gender budgeting, while impact on spending is more ambiguous, with greatest evidence of impact appearing in connection with infra-structure spending.

Nevertheless, the majority of studies evaluating the success of gender budgeting initiatives tend to focus on the success of their implementation; that is, whether governments are holding internal trainings on gender, undertaking analyses of the gendered impacts of the budget, seeking and analyzing sex disaggregated data, and designing programmes and setting targets based on gender (e.g. Nakray, 2009, evaluating whether gender budgeting works in India by assessing its implementation; Mushi and Edward, 2010, judging the success of gender budgeting initiatives in Tanzania by studying the success of programmatic implementation). Further study is needed to discern whether successful implementation of such programmes helps countries achieve equality.

In addition to exploring the impact of gender budgeting on achieving gender equality, this paper

also seeks to evaluate the impact of gender budgeting on spending, which is expected to produce better outcomes for inclusive development (Stotsky, 2016). Lahiri et al. (2002), using a fixed effects model of pooled least squares for the early 1990s, found that a one percent increase in spending on health and education resulted in a 0.33 percentage increase in the UNDP's Human Development Index and only a 0.06 increase in the Gender Development Index for a period between 1993-05. This demonstrates that public expenditure on human capital formation positively impacts gender development indicators. It is important to note that the effectiveness of public expenditures on health and education may vary across regions according to asymmetric scales of socioeconomic development (Chakraborty, 2016). This paper seeks to shed light on the nexus between spending and equitable development.

Gender Budgeting in Asia-Pacific Countries

More than a quarter of the 90-odd countries pursuing gender budgeting are located in the Asia Pacific (Budlender, 2015). Chakraborty in 2016 conducted a survey of 26 Asian countries' activities in gender budgeting, finding that many (including Brunei, China, Hong Kong, Japan, Myanmar, New Zealand, Papua New Guinea, Singapore, and Taiwan) have not implemented gender budgeting. Among Asian countries that are pursuing gender responsive budgeting, several are doing so by use of a budget circular: Afghanistan, Bangladesh, Bhutan, India, Indonesia, Malaysia, Nepal, and Pakistan. Korea, the Philippines, Timor Leste, Vietnam, the Lao People's Democratic Republic, and Mongolia have embodied gender budgeting in law. Cambodia and Sri Lanka are pursuing gender budgeting but have not incorporated the initiative into a budget circular document or law.

A typical budget may be composed of three primary elements – expenditures, revenues, and intergovernmental fiscal transfers – all three of which may be adapted through gender budgeting to advance gender equality. Government expenditures comprise the regular fiscal allocations for various departments and programmes. When public expenditures are designed according to gender priorities, they are often grouped by the percentage of the expenditure that will impact women. When measuring expenditures through a gender lens, it is especially critical to consider "fiscal marksmanship," or the difference between the authorized and

actually allocated funds (Chakraborty, 2016). Although government revenues have received less focus than expenditures as a means to advance gender equality goals, tax policies also can and should be designed with gendered priorities (Stotsky, 2016). Too lenient concessions to high-earning individuals or corporations, taxation of certain household necessities, and ensuring payment of certain tax credits to caregivers as opposed to the primary earner have all been shown to negatively or positively impact women (Sharp and Elson, 2008; Elson, 2006; St. Hill, 2002). Finally, intergovernmental fiscal transfers from the national government to lower-tier governments can also be modified to achieve gender-based priorities under a gender budgeting regime. Anand and Chakraborty (2016), for example, observed that climate change variables were factored into transfer formulas in India. Having suggested that climate change appeared in the transfer formulas, could similarly be based upon "gender-related indicators", such as to reward lower-tier governments for success in promoting gender parity in education enrollment.

Gender budgeting is most effective when it involves changes to both policy-making processes – such as determining budgeting allocations and designing programmes – and administrative systems – such as tracking expenditures and monitoring programme outcomes (Stotsky, 2016). Changes may be made at a policy level through executive branch decision-making, and/or formalized in budget circulars, the national budget law, or a separate law on gender budgeting. Almost all countries use a budget call circular or equivalent document that serves as an official notice from the finance ministry instructing government agencies how to submit their annual budget bids (Budlender, 2015). The budget circular may set the annual ceiling for each agency, identify priorities, and/or provide templates on how each ministry should submit its allocation bid. Some budget circulars are internal government documents, while others are open to the public. In practice, the form of budget circulars varies widely across countries. Critically, budget circulars may be used to set gender-related priority requirements or seek sex-disaggregated data from each ministry. A budget circular may also require each covered agency to submit a gender budget statement, most often a document showing what each agency is doing with respect to gender equality. A gender budgeting statement tends to look backwards at what an agency has done; it therefore, does not form

a part of the current years' policy prioritization and allocation determination. Budlender (2016) observes, however, that not all circulars require attention to gendered impacts, and similarly not all countries that incorporate gender into their budget circular require gender budget statements. Formalization of the gender budgeting initiative through budget circular has been termed gender budgeting by "fiscal fiat" (Chakraborty, 2016).

Measuring Gender Equality, Econometric Model and Study Findings

This section establishes an econometric estimation of the determinants of gender equality, by using the Gender Development Index and Gender Inequality Index as proxies for gender equality. As a precursor to our results, the following sections discuss complexities and challenges in measuring gender sensitive human development, drawing considerably from a similar discussion in Agarwal and Chakraborty (2016).

The Gender Development Index (GDI)

Human development can be understood as a process of enlarging people's choices and raising their level of well-being. The United Nations Development Programme (UNDP) has identified three elements of choice and well-being that are the most socially critical: the ability to lead a long and healthy life; the ability to acquire knowledge and be educated; and the ability to access the resources (often synonymous with income) necessary for a decent level of living (UNDP Human Development Reports, various years). A gender-neutral geometric mean of these three development dimensions was created, called the Human Development Index (HDI). Later in 1995, the UNDP constructed the Gender Development Index (GDI) as an offshoot from the HDI. The GDI has been used to measure global gender development since then. The GDI uses the same variables as the HDI, but adjusts them according to a country's degree of disparity in achievement across genders. Under the GDI, the average value of each of the component variables is substituted with "equally distributed equivalent achievements". The equally distributed equivalent achievement (X_{ede}) represents the level of achievement that would, if attained equally by women and men, be considered exactly as valuable to society as the actually observed disparate achievements. Lahiri et al. found in 2003 that taking an additively separable, symmetric,

and constant elasticity marginal valuation function with elasticity 2, the equally distributed equivalent achievement X_{ede} for any variable X is the following:

$$X_{ede} = [\, n_f\, (1/X_f) + n_m\, (1/X_m)]^{-1}$$

where, X_f and X_m are the values of the variable for females and males, and n_f and n_m are the population shares of females and males. X_{ede} is a 'gender-equity-sensitive indicator' (GESI). Under this calculation, for a chosen value of 2 for constant elasticity marginal valuation function, GDI is computed as follows:

$$GDI = \{L_{ede} + (2/3 \times A_{ede} + 1/3 \times E_{ede}) + Y_{ede}\}/3$$

The Gender Inequality Index (GII): The Gender Inequality Index (GII) replaced the GDI in 2010, serving as a measure of the disparities between the genders across three dimensions: (i) reproductive health, represented by the maternal mortality ratio (MMR) and the adolescent fertility rate (AFR); (ii) women's empowerment, represented by the proportion of parliamentary seats held by each sex (PR) and the sexes' rates of attainment of secondary education (SE); and (iii) economic activity, represented by the labour market participation rate (LFPR) of men and women in the market economy. The GII shows the loss in development resulting from gender inequality, where a score of 0 represents complete equality and a score of 1 implies complete inequality. GII is calculated by assessing the geometric mean across the dimensions. Because a mean can-not be calculated for zero values, a minimum of 0.1 percent is set for all "outlying" extreme values. For the MMR, a maximum rate is taken as 1000 deaths per 100,000 births and a minimum rate is taken as 10 per 100,000 births.

To calculate the geometric means for reproductive health, the aggregation formula for men and women must be different. For females (Gf):

$$Gf = \sqrt[3]{\left(\sqrt{\left(\frac{10}{MMR} \cdot \frac{1}{AFR}\right)} \cdot \sqrt{(PRf.SEf).LFRPf}\right)}$$

Rescaling by 0.1 helps quantify the truncation of the maternal mortality ratio minimum at 10. For males (Gm), the formula is as follows:

$$Gm = \sqrt[3]{\left(1.\sqrt{(PRm.SEm).LFRPm}\right)}$$

After the geometric mean of the three is calculated, the harmonic mean is used to aggregate across gender. Use of the harmonic mean has been criticised (Hawken and Munck, 2012), however, the rationale

for its use is that it captures the inequality between women and men and further adjusts for association between dimensions. The HARM index is as follows:

$$HARM(Gf.Gm) = \left(\frac{(Gf)^{-1} + (Gm)^{-1}}{2} \right)^{-1}$$

Before calculating the final index, a composite index is calculated using the geometric means of the arithmetic means. This ensures that equal weight is given to both the genders and then aggregated across the various dimensions, i.e. health, empowerment, and economic activity. The composite index is as follows:

$$G(\overline{f}, \overline{m}) = \sqrt[3]{\overline{Health} . \overline{Empowerment} . \overline{LFPR}}$$

Where,

$$\overline{Health} = \frac{\left(\sqrt{\left(\frac{10}{MMR} \cdot \frac{1}{AFR} \right)} + 1 \right)}{2}$$

$$\overline{Empowerment} = \frac{\left(\sqrt{(PRf.SEf)} + \sqrt{(PRm.SEm)} \right)}{2}$$

$$\overline{LFPR} = \frac{(LFPRf + LFPRm)}{2}$$

Symbolically, the GII is finally represented as follows:

$$GII = 1 - \frac{HARM(Gf.Gm)}{G(\overline{f}, \overline{m})}$$

The higher the value of GII, the higher is the corresponding gender gap and loss in potential of human development. By highlighting this gendered loss in development potential, the GII helps identify where gender gaps could productively be closed.

Econometric Investigation

This section evaluates the relationship between gender budgeting and gender equality. The hypothesis we try to test is whether gender budgeting has positive impact on gender equality in Asia Pacific region. The scores on GDI and GII for each country are used as measures of gender equality or inequality. For both types of equality measures, the econometric analysis estimates the determinants of gender equality, and includes gender budgeting among those determinates. The

dynamic panel estimation is used in the paper in an effort to correct any endogeneity issues occurring in the static (fixed and random effects) models. The dynamic panel estimates methodology by Arellano and Bond (1991) is based on the instrumental variables approach. We can generate better – more efficient – estimates of the dynamic panel data model by applying an instrumental variable method in a Generalized Method of Moments (GMM) context. As the dynamic panel estimators are instrumental variable methods, it is particularly important to evaluate the Sargan–Hansen test results when they are applied.

The estimates are checked for diagnostics statistics using AR test for autocorrelation of the residuals. In Arenello Bond methodology, the residuals of the differenced equation may possess serial correlation. The difference GMM approach used by Arenello and Bond is to tackle the endogeneity. The Arenello Bond methodology deals with endogeneity by transforming the data to remove the fixed effects. However, any first difference (FD) transformation removes the fixed effect at the cost of initiating a correlation between $\Delta y_{i,t-1}$ and Δv_{it} , both of which have a term dated (t − 1). The disadvantage of the first difference transformation is that it widens the gaps in unbalanced panels. If some value of y_{it} is missing, then both Δy_{it} and $\Delta y_{i,t-1}$ will be missing in the transformed data. However, the panel we used for the analysis is highly balanced and therefore it will not affect our Arenello-Bond dynamic models.

The model we consider for analysis is as follows, where we test whether gender budgeting (GB) is a significant determinant of gender equality (GE) in Asia Pacific region, along with control variables (X).

$$GE_{it} = a + b_1 GB_{it} + b_2 X_{it} + \square_{it}$$

The control variables we use in our models are log of public spending on health and education, GDP per capita and female labour force participation. The gender equality is proxied by two variables, Gender Development Index (GDI) and Gender Inequality Index (GII).

The dynamic panel estimates in Table 1 shows that gender budgeting is significantly and positively related to GDI in Asia Pacific countries. In the dynamic panel model, public spending on health and education, as well as growth, are found insignificant in determining GDI.

Table 1: Determinants of GDI and GII (Dynamic Panel Estimates)

Variables	Model (1) GDI	Model (2) GII
Lagged GDI	0.7711*	0.7167*
	(10.5700)	(0.0571)
Log of GDP per capita	0.0001	0.0000
	(0.8300)	(0.0000)
Female labor force participation rate	0.0019	-0.0041*
	(1.6200)	(0.0017)
Log of public spending on education	0.0004	0.0031
	(0.2800)	(0.0022)
Log of public spending on health	-0.0011	-0.0045*
	(-0.7400)	(0.0024)
Gender Budgeting in Call Circular regime	0.0024*	-0.0035*
	(3.1100)	(0.0008)
Constant	-1.8669*	2.9819*
	(-3.1300)	(0.6693)

Note: lags(i), vce robust estimates and artests(2). The figures in the bracket refers to standard error.

Source: (Basic Data), UN Human Development Reports, IMF Gender Database and World Development Indicators

The results also show that GII is significantly determined by gender budgeting initiatives, public spending on health and female labour force participation. Spending on education and economic growth variables are found insignificant in reducing the GII. The estimates showed that a one per cent increase in public health spending in Asia Pacific can reduce GII by 0.0045 percentage points, while rise in female labour force participation can reduce GII by 0.0041 percentage points.

Impact of Gender Budgeting on Fiscal Space

Against a backdrop of fiscal consolidation and rule-based fiscal policy, countries in the region are increasingly adhering to a three per cent ratio of fiscal deficit to GDP. In India, the Fiscal Responsibility and Management Review committee has recommended the national and subnational governments to adhere to a debt-GDP ratio of 60%. In determining fiscal space, could gender budgeting be a determinant?

To analyse this, we have examined sectoral patterns in public spending in education and health, and examined whether gender budgeting has any impact on public spending on these sectors. The dynamic panel estimates in Table 2 reveal that gender budgeting is found insignificant in increasing fiscal spending on health. We proxied Maternal Mortality Rate (MMR) as the gender-related health indicator, which was found significant in determining fiscal spending in health. Public spending on health increases with increase in economic growth.

Table 2: Effect of Gender Budgeting on Fiscal Space

(Dynamic Panel Estimates for Health Sector in Asia Pacific)

Variables	Coefficients
Lagged (health spending)	0.6795*
	(.0447)
Log of GDP per capita	0.0001*
	(0.0000)
Gender Budgeting in Call Circular	-0.0068
	(0.0167)
Maternal Mortality Rate	0.0017*
	(0.0007)
constant	6.3525
	(14.4790)

Note: lags(i), vce robust estimates and artests(2)

Source: (Basic Data), UN Human Development Reports, IMF Gender Database and World Development Indicators

The dynamic panel estimates in Table 3 show that gender budgeting does not have an impact on fiscal space in the education sector. Moreover, the impact of gender budgeting on aggregate fiscal space has not been attempted, as the sectoral inferences are insignificant. Overall GDP and the sectoral outcome indicators are found to be the determinants of sectoral fiscal space.

Table 3: Effect of Gender Budgeting on Fiscal Space

(Dynamic Panel Estimates for Education)

Variables	Coefficients
Lagged education spending	0.7065
	(0.5473)

Log of public spending on health	0.8933
	(0.5774)
Log of GDP per capita	0.0020*
	(0.0010)
Gender Budgeting in Call Circular	0.1982
	(0.3511)
Female Literacy rate	-0.1893*
	(0.0991)
Constant	-172.6384
	(297.4006)

Note: lags(i), vce robust estimates and artests(2). The figures in the bracket refers to standard errors.

Source: (Basic Data), UN Human Development Reports, IMF Gender Database and World Development Indicators

Conclusion

Following the methodology of Stotsky and Zaman (2016), this study has analysed the impact of gender budgeting on gender equality indicators in gender budgeting and non-gender budgeting countries, at the aggregate level and disaggregated levels. Study has used the GDI based on equally distributed equivalent methodology to arrive at gender equality sensitive indicators on three dimensions – education, health and income – as gender a combined equality outcome measure. Study has also used the Gender Inequality Index (GII) to capture the gender disparities in health, women's empowerment, and labor force participation. Study has categorized the countries into *gender budgeting and non-gender budgeting* based on whether countries have integrating gender budgeting processes in a formalized manner. Using dynamic GMM estimation for the panel data, the study has found that gender budgeting efforts have significant impact on gender equality sensitive indices as compared to economic growth. Public policy variables like public spending on health and education were also found relevant for the progress in gender equality in the region. Finally, study evaluated the impact of gender budgeting on increasing fiscal spending in health and education, using MMR rates as a proxy for health and the gender disparity ratio in education enrolment (ratio of female to male students enrolled at the relevant schooling divided by the cohort of that age group) as a proxy variable for education outcomes. The implications of gender budgeting in these areas were insignificant. This has public policy implications as the countries in the region have not yet incorporated gender budgeting as a prioritization in their spending decisions in education and health sectors.

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