Sector Specific Effectiveness of Gender Budgeting on Gender Equality and Fiscal Space: Empirical Evidence From Asia Pacific

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This paper analyses the effect of gender budgeting processes on gender equality and fiscal spaces in Asia Pacific countries, formulating an empirical framework for gender budgeting (gb) and non-gender budgeting (ngb) Asian countries to investigate the impact of gender budgeting on reducing gender inequality. We use the equally distributed equivalent (X_{ede}) methodology to arrive at gender equality sensitive indicators (gesi) on three dimensions – education, health, and income – combined as a gender equality outcome measure. Countries are categorized as gb or ngb based on whether their ministries of finance integrate gender budgeting into budget call circulars. The panel data analysis shows that gender budgeting efforts have significant impact on gesi as compared to economic growth. Public policy variables like public spending on health and education are also found relevant for progress in gender equality in the region. Sector-specific equations for education, health, and labour force participation under random effects models and dynamic panel estimates revealed that the implications of gender budgeting at sectoral level outcomes and fiscal space are more ambiguous. At the sectoral level, we use the ratio of gender disparity in education enrolment as a proxy for education outcomes and maternal mortality rates as a proxy for reproductive health outcomes. Public policy variables are shown more relevant than growth variables at the sectoral level in education and health. Finally, the impact of gender budgeting on female labour force participation is found to be insignificant. The empirical evidence from our analysis further strengthens the rationale for employing gender budgeting to formulate inclusive fiscal policy for development.

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Key words: *gender budgeting, fiscal policy, gender equality, Asia Pacific*
JEL codes: H00, I3, J1

I. Introduction

Gender budgeting is an approach to government fiscal policy 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.[1] 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.[2]

More than 90 governments around the world, a quarter of which are in Asia, are pursuing gender budgeting.[3] 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 both of 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, second, causes growth, more equitable development of women and society generally, and equal achievement of human rights.

The links 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

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1 Christine M Chinkin, 'Gender Mainstreaming in Legal and Constitutional Affairs: A Reference Manual for Governments and Other Stakeholders' (Gender Management System Series, London: Commonwealth Secretariat 2001); Janet G Stotsky, 'Gender Budgeting: Fiscal Context and Overview of Current Outcomes' (2016a) International Monetary Fund Working Paper 16/149, Washington, DC: IMF.

2 Lekha Chakraborty, 'Gender-Responsive Budgeting as Fiscal Innovation: Evidence from India on Processes' (2014) Working Paper No. 797, Levy Economics Institute, New York: Levy Economics Institute.

3 Debbie Budlender, Budget Call Circulars and Gender Budget Statements in the Asia Pacific: A Review (UN Women 2015).

yield growth.[4] However, there is certainly strong evidence that gender budgeting can indirectly raise equitable growth through its impact on fiscal policies.[5] It is more assuredly found that reducing gender inequality does promote inclusive and equitable development, advancement of women and societies, and achievement of human rights.[6]

The link in the first part of the argument, however – that gender budgeting actually reduces gender inequality – has been less clearly affirmed. As Stotsky has observed, there have been few efforts to assess the results of gender budgeting in a quantitative manner.[7] Stotsky asks 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.[8] 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.[9]

This study seeks to extend work begun 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 spending in these areas yields better outcomes for inclusive development.[10] 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 both of the formality of their approach to gender budgeting, and their legal climate as regards gender equality

4 David Cuberes and Marc Teignier, 'Gender Inequality and Economic Growth: A Critical Review' (2014) Journal of International Development 26, 260-76.

5 Naila Kabeer and Luisa Natali, 'Gender Equality and Economic Growth: Is There a Win-Win?' (2013) 2013, 417 IDS Working Paper, Brighton: Institute of Development Studies; Janet G Stotsky and A Zaman, 'The Influence of Gender Budgeting in Indian States on Gender Inequality and Fiscal Spending' (2016) International Monetary Fund Working Paper 16/227.

6 World Bank, *World Development Report 2012: Gender Equality and Development* (World Bank 2011).

7 Janet G Stotsky and A Zaman, 'The Influence of Gender Budgeting in Indian States on Gender Inequality and Fiscal Spending' (2016) International Monetary Fund Working Paper 16/227.

8 ibid, 7.

9 Keerty Nakray, 'Gender Budgeting: Does it Really Work? Some Experience from India' (2009) 37 (2) Policy and Politics 307-10; Venosa Mushi and Mamkwe Edward, 'Challenges and Successes of Gender Budgeting Initiatives: A Case Study of Tanzania' (2010) 7(2) Accountancy and Business Review Journal 19-24.

10 Ashok Lahiri, Lekha S Chakraborty and PN Bhattacharyya, 'Gender Budgeting in India' (2003) National Institute of Public Finance and Policy.

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 preparing 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' future study will additionally explore what, if any, the nexus is 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; and identifies additional considerations on the method of formalization of gender budgeting, and the broader gender legal climate, in the studied countries. Section IV discusses the empirical approach and provides our econometric model and results. Section V analyses the results across gender budgeting and non-gender budgeting countries. And Section VI offers concluding remarks and implications for policy on gender budgeting.

II. Literature Review

A. Gender Inequality's Impact on Efficiency and Equity

Our analysis of the effectiveness of gender budgeting in Asia begins with a survey of the literature outlining what, exactly, gender budgeting is meant to achieve. 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 both of 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 inequality; and second, that reduction in gender inequality in turn leads to positive outcomes in efficiency and equity.

1. *Gender Inequality and Economic Growth*

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.[11] 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.[12]

The International Monetary Fund (IMF) asserts that fiscal reform policies influence growth by increasing workforce participation, encouraging personal and state investment, strengthening human capital, and raising total factor productivity.[13] Papers arguing that reducing gender inequality sparks growth typically centre on the first three IMF growth factors. Discussing labour force participation, for example, Aguirre et al. posit that raising female labour force participation to match country-specific male levels could raise GDP by percentage points ranging from 5 percent in the United States to 34 percent in Egypt.[14] Cuberes and Teignier suggest that GDP per capita losses resulting from gender gaps in the labour market may be as high as 27 percent for some regions.[15] The World Bank posits that "[s]pecifically 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".[16] Considering the second factor of personal investment, ensuring women equal property rights,

11 M Hill, Elizabeth Anne and King, 'Women's Education and Economic Well-being' (1995) 1(2) Feminist Economics 21–46; David Dollar and Roberta Gatti, 'Gender Inequality, Income, and Growth: Are Good Times Good for Women?' (1999) 1 World Bank Policy Research Report on Gender and Development; Stephan Klasen, 'Low Schooling for Girls, Slower Growth for All? Cross-Country Evidence on the Effect of Gender Inequality in Education on Economic Development' (1999) 16(3) World Bank Economic Review 345–73; Stephen Knowles, Paula Lorgelly and P Dorian Owen, 'Are Educational Gender Gaps a Brake on Economic Development? Some Cross-Country Empirical Evidence' (2002) 54(1) Oxford Economic Papers 118–49; Berta Esteve-Volart, 'Gender Discrimination and Growth: Theory and Evidence from India' (2004) The Suntory and Toyota International Centres for Economics and Related Disciplines (STICERD) Development Economics Papers 42, London School of Economics; Gunseli Berik, Yana Van Der Meulem Rodgers and Stephanie Seguino, 'Feminist Economics of Inequality, Development, and Growth.' (2009) 15 Feminist Economics 1-33.

12 David Cuberes and Marc Teignier, 'Gender Inequality and Economic Growth: A Critical Review' (2014) Journal of International Development 26, 260-76.; Janet G Stotsky and A Zaman, 'The Influence of Gender Budgeting in Indian States on Gender Inequality and Fiscal Spending' (2016) International Monetary Fund Working Paper 16/227.

13 International Monetary Fund, 'Fiscal Policy and Long-Term Growth' (2015) IMF Policy Paper.

14 Deanne Aguirre, Leila Hoteit, Christine Rupp and Karim Sabbagh 'Empowering the Third Billion. Women and the World of Work in 2012' (2012) Booz and Company.

15 David Cuberes and Marc Teignier, 'Gender Gaps in the Labor Market and Aggregate Productivity' (2012) Sheffield Economic Research Paper Series SERP Number 2012017.

16 World Bank, *World Development Report 2012: Gender Equality and Development* (World Bank 2011) 264.

for example, is seen as an important tool to help women receive credit to fund new small businesses.[17] Strengthening women's property rights can also increase households' agricultural production through causing more efficient sharing of resources between men to women.[18] Finally, considering the factor of human capital, Klasen 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.[19] Kabeer and Natali 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.[20]

But Bandiera and Natraj assert that the empirical research has yet to identify the causal link from inequality to growth,[21] and Cuberes and Teignier 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.[22] Indeed, Berik says 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".[23] For example, research by Seguino in 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.[24] This inequality has been an impetus for trade and growth. Berik 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.[25]

What seems most likely is that the causality does 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 *in*equality itself

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17 ibid, 16.

18 Christopher Udry, 'Gender, Agricultural Production, and the Theory of the Household' (1996) 104(5) Journal of Political Economy 1010–46.

19 Stephan Klasen, 'Does Gender Inequality Reduce Growth and Development? Evidence from Cross-country Regressions' (1999) Policy Research Report on Gender and Development, World Bank.

20 Naila Kabeer and Luisa Natali, 'Gender Equality and Economic Growth: Is There a Win-Win?' (2013) 2013, 417 IDS Working Paper, Brighton: Institute of Development Studies.

21 Oriana Bandiera and Ashwini Natraj 'Does Gender Inequality Hinder Development and Economic Growth? Evidence and Policy Implications' (2013) 28(1) World Bank Research Observer 2-21.

22 David Cuberes and Marc Teignier, 'Gender Inequality and Economic Growth: A Critical Review' (2014) Journal of International Development 26, 260-76.

23 Gunseli Berik, Yana Van Der Meulem Rodgers and Stephanie Seguino, 'Feminist Economics of Inequality, Development, and Growth' (2009) 15 Feminist Economics 1-33.

24 Stephanie Seguino, 'Gender, Distribution, and Balance of Payments Constrained Growth in Developing Countries' (2008) Working Paper 133, Political Economy Research Institute.

25 Gunseli Berik, Yana Van Der Meulem Rodgers and Stephanie Seguino, 'Feminist Economics of Inequality, Development, and Growth' (2009) 15 Feminist Economics 1-33.

yields growth, that is a reminder to policy makers that there are other reasons than growth, namely equity, to pursue inequality reduction.

2. *Gender Inequality and Equitable Development*

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.[26]

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.[27] 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.[28] 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.[29]

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

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26 World Bank, *World Development Report 2012: Gender Equality and Development* (World Bank 2011).

27 ibid, 26.

28 Rhonda Sharp and Diane Elson, 'Improving Budgets: A Framework for Assessing Gender Responsive Budget Initiatives' (2008) Mimeo, Adelaide: Hawke Research Institute for Sustainable Societies, University of South Australia; Janet G Stotsky, 'Gender Budgeting: Fiscal Context and Overview of Current Outcomes' (2016a) International Monetary Fund Working Paper 16/149, Washington, DC: IMF.

29 Lekha Chakraborty 'Asia: A Survey of Gender Budgeting Experiences' (2016) International Monetary Fund Working Paper 16/150; Lisa Kolovich and Sakina Shibuya, 'Middle East and Central Asia: A Survey of Gender Budgeting Efforts' (2016) International Monetary Fund Working Paper 16/151.

overall.[30] 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".[31] As discussed under the section on growth, a primary aspect of this argument is that development of women yields both immediate and long-term benefits for their children and for society. The World Bank identifies several studies discussing these linkages.[32] For example, in China, increasing women's income by 10 percent of the average household income correspondingly increased by one percent the survival of girl children and increased years of schooling for girls and boys.[33] In Pakistan, a study found that children whose mothers attended even one year of school spend, themselves, an hour more studying each day, and have higher test scores.[34] Greater lands rights of mothers in Nepal has been linked to stronger health of children.[35] Greater representation of women in local government in India has yielded increased provision of public goods desired by both men and women.[36] And in India and Nepal, giving women a greater role in management of forests has led to significantly stronger conservation results.[37] 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.

3. *Gender Inequality and Human Rights*

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 act of gender budgeting helps governments fulfil their international legal obligations to seek sex 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

30 Janet G Stotsky, 'Gender Budgeting: Fiscal Context and Overview of Current Outcomes' (2016a) International Monetary Fund Working Paper 16/149, Washington, DC: IMF.

31 World Bank, *World Development Report 2012: Gender Equality and Development* (World Bank 2011) 3.

32 ibid, 32.

33 Nancy Qian, 'Missing Women and the Price of Tea in China: The Effect of Sex-Specific Earnings on Sex Imbalance' 123 (3) Quarterly Journal of Economics 1251–85.

34 Tahir Andrabi, Jishnu Das and AI Khwaja, 'A Dime a Day: The Possibilities and Limits of Private Schooling in Pakistan' (2011) 52(3) Comparative Education Review 329–55.

35 Keera Allendorf, 'Do Women's Land Rights Promote Empowerment and Child Health in Nepal?' (2007) 35(11) World Development 1975–88.

36 Raghabendra Chattopadhyay and Esther Duflo 'Women as Policy Makers: Evidence from a Randomized Policy Experiment in India' (2004) 72(5) Econometrica 1409–43.

37 Bina Agarwal, 'Does Women's Proportional Strength Affect Their Participation? Governing Local Forests in South Asia' (2010a) 38(1) World Development 98–112; Bina Agarwal, *Gender and Green Governance: The Political Economy of Women's Presence Within and Beyond Community Forestry* (Oxford University Press 2010).

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 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 has taken the lead in demonstrating how gender budgeting can help governments meet their treaty obligations to ensure gender equality.[38] 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 does require 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 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.[39]

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[38] Diane Elson, *Budgeting for Women's Rights: Monitoring Government Budgets for Compliance with CEDAW* (UNIFEM 2006).

[39] ibid, 39.

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.[40] 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.

B. Gender Budgeting and Gender Inequality

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 and Chakraborty observe, further research is needed to test empirically this first link in the chain.[41] Some analysis has been done of gender budgeting's tangible impact on gender equality. For example, Chakraborty 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.[42] 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 centres to lighten women's home care responsibilities. Stotsky analysed 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.[43] 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 infrastructure spending.

Nevertheless, the majority of studies evaluating the success of gender budgeting initiatives tend to focus on the success of their implementation; that

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40 Lekha Chakraborty 'Asia: A Survey of Gender Budgeting Experiences' (2016) International Monetary Fund Working Paper 16/150; Lisa Kolovich and Sakina Shibuya, 'Middle East and Central Asia: A Survey of Gender Budgeting Efforts' (2016) International Monetary Fund Working Paper 16/151.

41 Janet G Stotsky and A Zaman, 'The Influence of Gender Budgeting in Indian States on Gender Inequality and Fiscal Spending' (2016) International Monetary Fund Working Paper 16/227; Lekha Chakraborty 'Asia: A Survey of Gender Budgeting Experiences' (2016) International Monetary Fund Working Paper 16/150.

42 Lekha Chakraborty 'Asia: A Survey of Gender Budgeting Experiences' (2016) International Monetary Fund Working Paper 16/150.

43 Janet G Stotsky and A Zaman, 'The Influence of Gender Budgeting in Indian States on Gender Inequality and Fiscal Spending' (2016) International Monetary Fund Working Paper 16/227.

is, whether governments are holding internal trainings on gender, undertaking analyses of the gendered impacts of the budget, seeking and analysing sex disaggregated data, and designing programmes and setting targets based on gender (e.g. Nakray, evaluating whether gender budgeting works in India by assessing its implementation;[44] Mushi and Edward, judging the success of gender budgeting initiatives in Tanzania by studying the success of programmatic implementation[45]). Further study is needed to discern whether successful implementation of such programmes helps countries achieve equality.

C. Public Spending and Inclusive Development

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.[46] Lahiri et al., 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.[47] 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.[48] This paper seeks to shed light on the nexus between spending and equitable development.

III. Overview of Gender Budgeting and its Formalization in Asia-Pacific Countries

More than a quarter of the 90-odd countries pursuing gender budgeting are located in the Asia Pacific.[49] 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

44 Keerty Nakray, 'Gender Budgeting: Does it Really Work? Some Experience from India' (2009) 37 (2) Policy and Politics 307-10.

45 Venosa Mushi and Mamkwe Edward, 'Challenges and Successes of Gender Budgeting Initiatives: A Case Study of Tanzania' (2010) 7(2) Accountancy and Business Review Journal 19-24.

46 Janet G Stotsky and A Zaman, 'The Influence of Gender Budgeting in Indian States on Gender Inequality and Fiscal Spending' (2016) International Monetary Fund Working Paper 16/227.

47 Ashok Lahiri, Lekha S Chakraborty and P N. Bhattacharyya, 'Gender Budgeting in India' (2003) National Institute of Public Finance and Policy.

48 Lekha Chakraborty 'Asia: A Survey of Gender Budgeting Experiences' (2016) International Monetary Fund Working Paper 16/150.

49 Debbie Budlender, *Budget Call Circulars and Gender Budget Statements in the Asia Pacific: A Review* (UN Women 2015).

countries that are pursing gender responsive budgeting, several are doing so by use of a budget circular: Afghanistan, Bangladesh, Bhutan, India, Indonesia, Malaysia, Nepal, and Pakistan.[50] 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 pursing gender budgeting but have not incorporated the initiative into a budget circular document or law.

A. Elements of the Budget Adaptable Through Gender Budgeting

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 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.[51] 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 positive impact women.[52] 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, for example, observing that climate change variables were factored into transfer formulas in India, have suggested that 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.[53]

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50 Australia was the first country to create gender budgeting statements, but because it ceased doing so in 2014, this study does not include it as a country having formalized gender budgeting in a budget circular.

51 Janet G. Stotsky, 'Gender Budgeting: Fiscal Context and Overview of Current Outcomes' (2016) International Monetary Fund Working Paper 16/149, Washington, DC: IMF.

52 Diane Elson, *Budgeting for Women's Rights: Monitoring Government Budgets for Compliance with CEDAW* (UNIFEM 2006); Rhonda Sharp and Diane Elson, 'Improving budgets: A Framework for Assessing Gender Responsive Budget Initiatives' (2008) Mimeo, Adelaide: Hawke Research Institute for Sustainable Societies, University of South Australia; St. Donna Hill, 'The United Kingdom: A Focus on Taxes and Benefits' in D Budlender and G Hewitt (eds), *Gender Budgets Make More Cents: Country Studies and Good Practice* (Commonwealth Secretariat 2002).

53 Abhishek Anand and Lekha Chakraborty, 'Integrating Gender Criteria in Intergovernmental Transfers in India' (2016) Working Paper 874, Levy Economics Institute of Bard College, New York.

B. Formalizing Gender Budgeting: Budget Call Circulars, Budget Statements, and Budget Laws

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.[54] 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.[55] 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. Such gender budget statements tend to be most used as accountability tools, although this is not the case in certain countries highlighted below. A gender budgeting statement tends to look backwards at what an agency has done; it therefore does not form part of the current years' policy prioritization and allocation determination. Budlender 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.[56] Formalization of the gender budgeting initiative through budget circular has been termed gender budgeting by "fiscal fiat".[57]

The research question in this paper compares outcomes between countries employing or not employing gender budgeting, without distinction as to whether and how gender budgeting initiatives are formalized in each country. We have noted, however, differences in the approach to gender budgeting – mere policy approach, or fiscal fiat, or legal fiat – taken by these countries. The 2016 UN Women review of budget circulars found little positive or negative evidence that "engendered" budget circulars had effected changes in the allocations and

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[54] Janet G Stotsky, 'Gender Budgeting: Fiscal Context and Overview of Current Outcomes' (2016) International Monetary Fund Working Paper 16/149, Washington, DC: IMF.

[55] Debbie Budlender, *Budget Call Circulars and Gender Budget Statements in the Asia Pacific: A Review* (UN Women 2015).

[56] ibid, 56.

[57] Lekha Chakraborty 'Asia: A Survey of Gender Budgeting Experiences' (2016) International Monetary Fund Working Paper 16/150.

expenditures of those countries' budgets, or achieved a difference in the lives of women and girls.[58] However, that review focused specifically on countries definitely engendering their budget circulars. Future broader comparative analysis may indicate that *vis-à-vis* countries not utilizing circulars at all for their gender budgeting initiative, countries pursuing gender budgeting by fiscal fiat may achieve better outcomes. We do not make this claim in the paper, but note that further research into the potential benefits of formalization of gender budgeting is underway.

This paper also has not sought to assess whether countries like Korea and the Philippines, which go an arguable step further to cement their gender initiative by legal fiat, are yet more successful. At a theoretical level, a legislated gender budgeting initiative evidences buy-in from the legislative branch, which may suggest that a more participative and democratic process has been undertaken to generate the gender budgeting initiative. An initiative having broader-based popular support may be more successful and enduring. Additionally, in non-parliamentary democracies where the party of the legislature may differ from the party of the executive, a gender budgeting initiative formalized in legislation may be more immune to shifts in political power and thus more difficult to reverse. Yet counter-arguments also exist. Clearly not all legislation has public buy-in: legislation may be passed for all sorts of political reasons including to appease foreign donors. Where actual popular support is lacking, legislation may prove very weak. Further, if gender budgeting legislation is passed without strong support of the implementing ministries, its chances of success are practically low. Moreover, legislation without adequate funding and enforcement will be ineffectual regardless of its popular support. As described above, Mongolia is an example of a country whose law on gender budgeting has, for unexplored reasons, gone unimplemented for over five years. Again, we would note only that a future study could drill more usefully into the comparative benefits of fiscal or legal fiat. Given the low numbers of countries globally that have pursued gender budgeting through law, such a study might need to cross a wider geographic range than the Asia-Pacific alone, and must control for other variables bearing on the success or not of legislative initiatives.

IV. Measuring Gender Equality, Econometric Model and Results

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

58 Debbie Budlender, *Budget Call Circulars and Gender Budget Statements in the Asia Pacific: A Review* (UN Women 2015).

development, drawing considerably from a similar discussion in Agarwal and Chakraborty (2016).[59]

A. 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:

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

B. 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

[59] ibid.

adolescent fertility rate (AFR);[60] (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 cannot 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.

C. Econometric Investigation

We use panel data estimations (static models) and Hausman test suggested for random effects. The Hausman test suggests between fixed effects and random effects model based on the null hypothesis that the time invariant part of the error terms are not correlated with the regressors. If the p value is above 0.05, the random effects model provides more efficient estimates.[61]

The econometric models reveal that GDI is positively and significantly linked to gender budgeting and education variables. The coefficients show that female literacy rate increases GDI by 0.004 percentage points while gender budgeting increases GDI by 0.062 percentage points. Economic growth is found insignificant in determining GDI and GII (Table 1). We will rerun the models using dynamic panel estimation, correcting for endogeneity issues.

[60] Maternal Mortality Rate is defined as the number of female deaths per 100,000 live births annually, from any cause related to, or aggravated by pregnancy or its management. AFR is the number of births per 1000 women aged 15-19.

[61] We performed fixed effects and random effects model. A test of preferring one among these models can be interpreted as a test of over identifying restrictions. Wooldridge (2002) suggest that the fixed effects estimator uses the orthogonality conditions that the regressors are uncorrelated with the idiosyncratic error; E(Xit*eit) = 0. It is further suggested that the random effects estimator uses the additional orthogonality conditions that the regressors are uncorrelated with the group-specific error ui (the "random effect"), E(Xit*ui) = 0. In other words, these additional orthogonality conditions are over identifying restrictions. The random effects model is re-estimated augmented with additional regressors along with original regressors transformed as deviations from the mean values. While the fixed-effects coefficients are consistent, the random effects coefficient are more efficient. If p-value is greater than 0.05, the random effects estimators are selected.

Table 1— Determinants of GDI and GII: Random Effect Estimates

Variable	**Model I (a) GDI**	**Model I (b) GDI**	**Model 2 (a) GII**	**Model 2 (b) GII**
Education Outcomes-femLit	0.0048 (0.0007)	0.005 (0.001)	-0.004 (0.001)	-0.001 (0.001)
Log of GDP per capita				
Gender budgeting in Call Circular	0.0618* (0.0333)	0.062* (0.033)	0.021 (0.046)	0.048 (0.036)
Log of Public Spending on Health	0.0199 (0.0281)	0.006 (0.006)	0.062 (0.036)	0.006 (0.023)
_cons.	0.53574 (0.0891)	0.544 (0.089)	1.386 (0.113)	1.543 (0.088)

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

The Dynamic Panel Data methodology by Arellano and Bond is based on the instrumental variables approach.[62] We can estimate 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 DPD estimators are instrumental variables 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 Arellano Bond methodology, the residuals of the differenced equation may possess serial correlation. The difference GMM approach used by Arellano and Bond is to tackle the endogeneity. The Arellano 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 Δy 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 Arellano Bond dynamic models.

62 Manuel Arellano and Stephen Bond, 'Some tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations' (1991) 58(2) The Review of Economic Studies 277-297.

Table 2— Determinants of GDI: Dynamic Panel Estimates

Variables	**Coefficients**	**Standard Error**	**z-statistic**	**P>|z|**
Lagged GDI	0.7711	0.0729	10.5700	0.0000
Log of GDP per capita	0.0000	0.0000	0.8300	0.4090
Female labour force participation rate	0.0019	0.0012	1.6200	0.1050
Log of public spending on education	0.0004	0.0014	0.2800	0.7770
Log of public spending on health	-0.0011	0.0015	-0.7400	0.4570
Gender Budgeting in Call Circular	0.0024	0.0008	3.1100	0.0020
Constant	-1.8669	0.5963	-3.1300	0.0020

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 estimation reinforced the significance of gender budgeting in Asia Pacific region to improve GDI (Table 2). However, in the dynamic panel model, the public spending on health and education and economic growth are found insignificant in determining GDI. The results are the same with the outcome variables on education as well.

The estimates from dynamic panel through Arellano Bond methodology suggests that GII is significantly determined by public spending on health, female literacy, and gender budgeting initiatives. The estimates showed that one per cent increase in public health spending in Asia Pacific can reduce GII by 0.01 percentage points, while a rise in female literacy rate can reduce GII by 0.0027 percentage points. The results hold good after controlling for female labour force participation rate in the region; that gender budgeting, health spending and female force participation rate matter for reducing GII in Asia Pacific (Table 3).

The dynamic panel estimates showed that gender budgeting initiatives through budget call circulars has the potential to reduce the gender inequality index in the Asia Pacific region. The estimates also revealed that one percent increase in public spending on health can reduce the GII by 0.005 percentage points, while spending on education and economic growth variables are found insignificant in reducing the GII (Table 3).

Table 3— Determinants of GII: Dynamic Panel – Arellano Bond – Estimates

Variables	**Coefficients**	**Standard Error**	**z-statistic**	**P>|z|**
Lagged GII	0.788	0.050	15.700	0.000
Log of GDP per capita	0.000	0.000	-0.590	0.557
Log of education spending	0.003	0.002	1.460	0.143
Log of health spending	-0.005	0.002	-1.950	0.051
Gender Budgeting in Call Circular	-0.003	0.001	-3.850	0.000
Constant	2.685	0.682	3.940	0.000
Gii	Coef.	Std.	z	P>|z|
With FLF				
Variables	**Coefficients**	**Standard Error**	**z-statistic**	**P>|z|**
Lagged GII	0.7167	0.0571	12.5500	0.0000
Log of GDP per capita	0.0000	0.0000	-1.2400	0.2150
Female labour force participation rate	-0.0041	0.0017	-2.3300	0.0200
Log of public spending in education	0.0031	0.0022	1.3900	0.1640
Log of public spending in health	-0.0045	0.0024	-1.8900	0.0580
Gender Budgeting in Call Circular	-0.0035	0.0008	-4.1500	0.0000
Constant	2.9819	0.6693	4.4600	0.0000

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

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

D. Sectoral analysis of determinants of gender equality in Asia Pacific

At the sectoral level, in models relate to determining Maternal Mortality Rate (MMR), education variables are found significant and have a negative relationship. The higher the female literacy, the lower the MMR by -9.73 percentage points. One percent rise in public spending on education decreases MMR by 23.034 percentage points. The economic growth, health spending and gender budgeting are found to be insignificant in reducing MMR in the Asia Pacific region (Table 4).

Table 4— Determinants of MMR: ArellANo Bond Estimates in Asia Pacific

Variable	**Model 3 (a) MMR**	**Model 3 (b) MMR**	**Model 3 (c) MMR**
Log of Public Spending in education	-6.067* (1.474)	-9.734* (0.819)	-8.742* (1.033)
Log of GDP per capita			
Education Outcomes – femLit	-23.036* (11.112)	-	-
Gender Budgeting in Call Circular	11.608 (69.943)	-75.788 (46.885)	-56.489 (54.425)
Log of Public Spending in Health	4.649 (12.852)	-	33.442 (23.717)
_cons.	732.620 (133.404)	928.586 (66.938)	824.806 (96.340)

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

At a sectoral level, education (female literacy rate) is determined by GDP per capita by 14.32 percentage points rise, however all other variables are found to be significant in equation on female literacy rate. When we tried Gender Disparity Index (GPI) in education variable, it was found that public spending on education increases GPI by 0.037 per cent. It is found that a one percent rise in GDP per capita decreases GPI by 0.107 percentage points, and a one percent increase in gender budgeting decreases GPI by 0.0106 percentage points. Public spending on health is found insignificant (Table 5).

Table 5— Determinants of Education: ArellANo Bond Estimates in Asia Pacific

Variable	**Model 4 FLIT**	**Model 5 GPI-ED**
Log of Public Spending on Education	-	-
Log of GDP per capita	14.32 (	
Education Outcomes-femLit	4.073 (3.677)	.0374* (.0151)
Gender budgeting in Call Circular	-	-.0106* (.0439)
Log of Public Spending on Health	-	-.0478 (.0184)
female labour force participation rate	-	-

Variable	**Model 4 FLIT**	**Model 5 GPI-ED**
_cons.	-58.215 (17.748)	.1015 (.0971)

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

At a sectoral level, the female labour force participation is not significantly determined by gender budgeting. This result is not surprising as the budgetary allocations under gender budgeting in the Asia Pacific countries are mostly on health and education, not significantly on care economy infrastructure or any other women empowerment related spending which will in turn increase the female labour force participation (Table 6).

Table 6— Determinants of Female Labour Force Participation: Arellano Bond Dynamic Panel Estimates for Asia Pacific

Variable	**Model 6 (a) FLF**	**Model 6 (b) FLF**
Log of Public Spending on Education	0.147* (0.051)	-
Log of GDP per capita		
Education Outcomes-femLit	-	-0.359 (0.368)
Gender budgeting in Call Circular	0.808 (3.919)	-2.221 (4.258)
Log of Public Spending on Health	1.392* (0.748)	1.115* (0.533)
_cons.	35.45 (5.053)	28.101 (3.657)

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

The results revealed that one percent increase in female literacy rate will increase female labour force participation by 0.147 percentage points. One percent rise in public spending on health increases female labour force participation by 1.39 per cent. Economic growth is found not stimulating female economic force participation.

V. Disaggregated analysis: results in gender budgeting and non-gender budgeting countries

A. Determining MMR reduction

At a disaggregated level analysis based on the categorization of gender budgeting and non-gender budgeting countries we have rerun the GLS regressions for the sectoral level variables. In case of MMR, we found that education spending by public sector (-33.04 percentage points) and female literacy rates (-7.93 percentage points) reduces MMR in non-GRB countries. However, the female labour force participation is found inducing MMR by 10.07 percentage points. The economic growth of a country is found to have no impact in reducing MMR. The public spending on health is also found insignificant in reducing MMR in Asia Pacific.

Table 7— Disaggregated Analysis of GRB and Non-GRB Countries: Arellano Bond Dynamic Panel Estimates in Asia Pacific

Variable	**Model 1 (a) FLF gb=0**	**Model 1 (b) FLF gb=1**	**Model 2 (a) FLIT gb=0**	**Model 2 (b) FLIT gb=1**	**Model 3 (a) MMR gb=0**	**Model 3 (b) MMR gb=1**
Log of public spending in education	-	-	-	-	-7.934 (2.060)	-5.878 (2.030)
Log of GDP per capita						
Education outcomes-female literacy rate	-.0517 (.678)	-.2793 (.406)	-8.502 (4.728)	2.607 (2.797)	-33.037 (18.130)	-18.556 (10.274)
Log of public spending in health	1.615 (.768)	.4271 (.734)	-19.420 (4.405)	-6771 (4.412)	9.221 (17.382)	-3.771 (21.464)
Female labour force participation rate	-	-	-	-	10.076 (3.855)	.7062 (3.1600)
constant	25.79 (4.392)	28.275 (4.440)	-84.929 (17.194)	-11.618 (18.416)	475.486 (165.316)	715.984 (239.271)

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

In gender budgeting countries, a one per cent increase in GDP per capita decreases MMR by 0.0019 percentage points. The female literacy rate was also found to be significant (-5.879 percentage points). However, female labour force participation and education and health spending by public sector are found to be insignificant in reducing MMR.

B. Determining increase in female literacy rate

In non-gender budgeting countries, one percent increase in GDP per capita increases female literacy rate by 21.53 percentage points, while public spending on health increases female literacy rate by 19.42 per cent. The public spending on education is found to be insignificant. In countries where is gender budgeting stipulated by Budget Circulars, the results showed that one percent increase in GDP per capita induces increase in female literacy by 11.55 percentage points, whereas public spending on health and education induce a rise of 6.711 and 8.5 percentage points (Table 7).

C. Determining rise in female labour force participation

In non-gender budgeting countries, the female labour force participation responds to increase in economic growth (GDP per capita) to a range of 1.38 percentage points and public spending on health by 1.61 percentage points (Table 7). Public spending on education is found to be insignificant in determining a rise in female labour force participation rate in non-gender budgeting countries. In gender budgeting countries, only economic growth is found to be significant by 1.035 percentage points. The public spending on education and health are found insignificant.

D. Impact of gender budgeting on fiscal space

Against the backdrop of fiscal consolidation and rule based fiscal rules, the countries in the region are increasingly adhering to a fiscal deficit to GDP ratio at three per cent. In India, Fiscal Responsibility and Management Review committee has recommended the national and subnational governments to adhere to a debt-to-GDP ratio of 60 percent threshold. 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 data analysis revealed that public spending on health increases with increase in economic growth (Table 8). However, gender budgeting is found insignificant in determining the fiscal space in health sector. Yet another variable that found significant in determining fiscal spending in health sector is health outcomes. We proxied maternal mortality rate as the gender related health indicator.

Table 8— Effect of Gender Budgeting on Fiscal Space: Arellano Bond Dynamic Panel Estimates for Health Sector in Asia Pacific

Variables	**Coefficients**	**Standard Error**	**z-statistic**	**P>|z|**
Lagged (health spending)	0.6795	0.0447	15.2100	0.0000
Log of GDP percapita	0.0001	0.0000	4.7100	0.0000
Gender Budgeting in Call Circular	-0.0068	0.0167	-0.4100	0.6850
Maternal Mortality Rate	0.0017	0.0007	2.4200	0.0150
_constant	6.3525	14.4790	0.4400	0.6610

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

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

Table 9— Effect of Gender Budgeting on Fiscal Space: Arellano Bond Dynamic Panel Estimates for Education Sector in Asia Pacific

Variables	**Coefficients**	**Standard Error**	**z-statistic**	**P>|z|**
Lagged education spending	0.7065	0.5473	1.2900	0.1970
Log of public spending on health	0.8933	0.5774	1.5500	0.1220
Log of GDP per capita	0.0020	0.0010	2.1200	0.0340
Gender Budgeting in Call Circular	0.1982	0.3511	0.5600	0.5720
Female Literacy rate	-0.1893	0.0991	-1.9100	0.0560
constant	-172.6384	297.4006	-0.5800	0.5620

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

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

The Arellano Bond estimates showed that gender budgeting does not have impact on fiscal space in education sector (Table 9). Overall GDP and the sectoral outcome indicators are found to be the determinants of sectoral fiscal space. The impact of gender budgeting on aggregate fiscal space has not been attempted as the sectoral inferences are insignificant.

VI. Conclusion

Following the methodology of Stotsky and Zaman, we have analysed the impact of gender budgeting on gender equality indicators in gender budgeting (gb) and non-gender budgeting (ngb) countries, at the aggregate level and disaggregated levels.[63] We have used the GDI based on equally distributed equivalent (X_{ede}) methodology to arrive at gender equality sensitive indicators (gesi) on three dimensions – education, health and income – as a gender equality outcome measure. We have also used the Gender Inequality Index (GII) to capture the gender disparities in health, women's empowerment, and labour force participation.

We have categorized the countries into gb and ngb based on the process of integrating gender budgeting processes in the budget call circulars published by respective Ministry of Finance of Asia-Pacific countries. Using random effects and dynamic GMM estimation for the panel data, the study 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.

The sector specific equations were also investigated for education, health, and labour force participation. The implications of gender budgeting at sector level fiscal space were insignificant. At sectoral level, we used 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 proxy variable for education outcomes and maternal mortality rate for reproductive health outcomes. The public expenditure variables were found more relevant than growth variables at sectoral level in education and health. However, the impact of gender budgeting on female labour force participation was found insignificant in Asia Pacific. This has public policy implications as the countries in the region have not yet incorporated care economy infrastructure policies. The effect of legal fiat of gender budgeting on gender development index and gender equality is beyond the scope of the paper, and would be published as the next paper.

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[63] Stotsky, JG and A Zaman, (n 5).

VII. Appendix

Table A1— Gender-Related Laws Adopted by Each Country

Country (34)	**Gender-Related Enactments (Social)**	**Gender-Related Enactments (Economic) (excluding gender budgeting)**	**Gender-Related Commitments (International)**	**GBR-Related Fiscal Fiat (FF) and/or Legal Fiat (LF)**
Afghanistan	a, c, g, h (statistics law to be reviewed)	C, E, H, N	i, ii	FF
Australia	a, (b N/A), c, d, e, f, i	A, B, F, J, K, L, M, N	i, ii, iii, iv	
Bangladesh	a, b, c, d, f, g	A, C, E, G, H, J, L	i, ii	FF
Bhutan	a, b, d, e, f	A (equal remuneration for equal worker qualifications), C, D, G, H, J, L		FF
Brunei Darussalam	b, c, d, i	C, F, J, L		
Cambodia	a, b, c, d, f, i	A, B, C, F, G, H, J, L, M, N	i, ii	
China	a, b, d, f, g, i	B, C, E, H, J, L, N	i, ii	
Cook Islands				
Fiji	a, (b N/A), d, f, i	A, C, D, G, H, J, L	i, ii	
Hong Kong	a, b, c, d, e, f, i	B, C, F, H, J, K, L, N	N/A	
India	a, b, c, d, f, g (local level only), i	B, C, G, H, I, J, L	i, ii	FF
Indonesia	a, b, c, d, e, f, g	C, F, H, I, L	i, ii	FF
Japan	a, (b N/A), c, d, f, i	B, C, G, H, L, M, N	iii	
Kiribati	a, (b N/A), c, d, f	A, C, F, J	i, ii	
Korea	a, b, c, d, e, f, g, h, i	B, C, D, G, H, J, L, M, N	iii	FF; LF
Laos	a, (b N/A), c, d, f, i	C, F, H, J, L, M	i, ii	FF; LF

Malaysia	a, b, c, d	C, G, H, I, J, L, N	i	FF
Maldives	a, b, d, e, f, i	B, C, D, E, F, G, H, L, M		
Mongolia	a, b, c, d, f, g, h, i	C, D, G, H, J, K, N	i, ii	
Myanmar	a, b, c, f, g, i	C, G, H, J, L		
Nepal	a, (b N/A), d, e, f, g, h (statistics law to be reviewed), i	C, F, G, H, J	i, ii	FF
New Zealand	a, (b N/A), d, e, f, h, i	B, C, F, G, J, K, L, M, N	i, ii	
Pakistan	a, c, d, f, g	C, G, H, J, L, N	i, ii	FF
Papua New Guinea	a, b, c, d, f, i	C, H	i, ii	
Philippines	(b N/A), c, d, e, f, i	A, C, F, H, J, K, L, N	i, ii	FF; LF
Samoa	a, (b N/A), d, e, f, h, i	A, C, D, E, F, G, H, L	i, ii	
Singapore	a, b, c, d, f, i	C, F, H, J, L, N	i	
Solomon Islands	a, (b N/A), d, f, i	C, E, G, J	i, ii	
Sri Lanka	a, b, c, d, f, h (statistics law to be reviewed), i	C, G, H, J, L	i, ii	
Taiwan	a, b, c, d, e, g, h, i	A, B, C, E, F, G, H, J, L, M, N	N/A	
Thailand	a, b, c, d, e, f, i	C, H, J, L, N	i	
Timor-Leste	a, b, c, d, e, f, h (statistics law to be reviewed), i	B, C, D, E, F, G, H, J, L, M, N		FF; LF
Vanuatu	a, (b N/A), d, f	C, D, E, F, G, H	i, ii	
Vietnam	a, b, c, d, e, f, h (statistics law to be reviewed), i	A, B, C, D, G, H, J, K (gender only) L, M, N	i, ii	LF

Gender-Related Economic Enactments (WB Data 2015-6)

A. Law mandates equal remuneration for men and women for equal work

B. Law mandates nondiscrimination based on gender in hiring

C. Law mandates paid or unpaid maternity leave

D. Law requires that mothers are guaranteed an equivalent position after maternity leave

E. Law gives special protections to pregnant or nursing workers

F. Law allows non-pregnant and non-nursing women to do the same jobs as men

G. Constitution has nondiscrimination clause mentioning gender

H. Constitution has an equality provision

I. Quota exists for women on corporate boards

J. Law specifically addresses sexual harassment

K. Law prohibits discrimination by creditors on the basis of gender and marital status in access to credit

L. Law allows women to do the same night hours as men

M. Law requires employer to provide leave to care for sick relatives

N. Childcare is subsidized or publicly available

Gender-Related Social Enactments (WB Data 2015-6, except where otherwise indicated in parentheses)

a. Law grants equal property ownership rights to men and women

b. Law allows married women same process as for married men to achieve National ID

c. Law prohibits or invalidates child or early marriage

d. Legislation exists on domestic violence

e. Law explicitly criminalizes marital rape

f. Law does not require married women to obey their husbands

g. Quota exists for women in parliament or local government

h. Existence of law on gender statistics (UNSD)

i. Inheritance rights discriminate do not against women and/or girls

Gender-Related International Commitments (ILO Data 2015-6)

i. Country has ratified ILO C100 – Equal Remuneration Convention

ii. Country has ratified ILO C111 – Discrimination (Employment & Occupation)

iii. Country has ratified ILO C156 – Workers with Family Responsibilities

iv. Country has ratified ILO C175 – Part-Time Work

v. Country has ratified ILO C177 – Home Work

vi. Country has ratified ILO C183 – Maternity Protection

Table A2— Gender-Related Laws Adopted by Each Country, Grouped by Purpose of the Law

Country	**Laws promoting equal working conditions for women (A, B, F, I J, L)**	**Laws supporting women's dual reproductive and productive responsibilities (C, D, E, M, N)**	**Laws supporting women's economic advancement in society (K, a, b, c, f, g, i)**
Australia	A, B, F, J, L	M, N	K, a, (b N/A), c, f, i
Bangladesh	A, J, L	C, E	a, b, c, f, g
Bhutan	A, J, L	C, D	a, b, c, f
Brunei Darussalam	F, J, L	C	b, c, i
Cambodia	A, B, F, J, L	C, M, N	a, b, c, f, i
China	B, J, L	C, E, N	a, b, f, g, i
Cook Islands			
Fiji	A, J, L	C, D	a, (b N/A), f, i
Hong Kong	B, F, J, L	C, N	K, a, b, c, f, i
India	B, I, J, L	C	a, b, c, f, g, i
Indonesia	F, I, L	C	a, b, c, f, g
Japan	B, L	C, M, N	a, (b N/A), c, f, i
Kiribati	A, F, J	C	a, (b N/A), c, f
Korea	B, J, L	C, D, M, N	a, b, c, f, g, i
Laos	F, J, L	C, M	a, (b N/A), c, f, i
Malaysia	I, J, L	C, N	a, b, c
Maldives	B, F, L	C, D, E, M	a, b, f, i
Mongolia	J	C, D, N	K, a, b, c, f, g, i

Country	**Laws promoting equal working conditions for women (A, B, F, I J, L)**	**Laws supporting women's dual reproductive and productive responsibilities (C, D, E, M, N)**	**Laws supporting women's economic advancement in society (K, a, b, c, f, g, i)**
Myanmar	J, L	C	a, b, c, f, g, i
Nepal	F, J	C	a, (b N/A), f, g
New Zealand	B, F, J, L	C, M, N	K, a, (b N/A), f, i
Pakistan	J, L	C, N	a, c, f, g
Papua New Guinea	--	C	a, b, c, f, i
Philippines	A, F, J, L	C, N	K, (b N/A), c, f, i
Samoa	A, F, L	C, D, E	a, (b N/A), f, i
Singapore	J, L	C, N	a, b, c, f, i
Solomon Islands	J	C, E	a, (b N/A), f, i
Sri Lanka	J, L	C	a, b, c, f, i
Taiwan	A, B, F, J, L	C, E, M, N	a, b, c, g, i
Thailand	J, L	C, N	a, b, c, f, i
Timor-Leste	B, F, J, L	C, D, E, M, N	a, b, c, f, i
Vanuatu	F	C, D, E	a, (b N/A), f
Vietnam	A, B, J, L	C, D, M, N	K (gender only), a, b, c, f, i

Note: Laws promoting equal working conditions for women

O. Law mandates equal remuneration for men and women for equal work

P. Law mandates nondiscrimination based on gender in hiring

F. Law allows non-pregnant and non-nursing women to do the same jobs as men

I. Quota exists for women on corporate boards

J. Law specifically addresses sexual harassment

L. Law allows women to do the same night hours as men

Laws supporting women's dual reproductive (care economy) and productive (market economy) responsibilities

Q. Law mandates paid or unpaid maternity leave

R. Law requires that mothers are guaranteed an equivalent position after maternity leave

S. Law gives special protections to pregnant or nursing workers

M. Law requires employer to provide leave to care for sick relatives

N. Childcare is subsidized or publicly available

Laws supporting women's economic advancement in society

K. Law prohibits discrimination by creditors on the basis of gender and marital status in access to credit

a. Law grants equal property ownership rights to men and women

b. Law allows married women same process as for married men to achieve National ID

c. Law prohibits or invalidates child or early marriage

d. Law does not require married women to obey their husbands

e. Quota exists for women in parliament or local government

f. Inheritance rights discriminate do not against women and/or girls