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Does Foreign Aid Improve Gender Performance in Recipient Countries?

Ranjula Bali Swain
and
Supriya Garikipati

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Ranjula Bali Swain and Supriya Garikipati[*]

Abstract

An explicit goal of foreign aid is to promote female empowerment and gender equality in developing countries. The impact of foreign aid on these latent variables at the country level is not yet known because of various methodological impediments. We address these by using Structural Equation Models. We use data from the World Development Indicators, the World Governance Indicators and the OECDs Credit Reporting System to investigate if foreign aid has an impact on gender performance of recipient countries at the country level. Our results suggest that to observe improvement in gender performance at the macro-level, foreign aid must target the gender outcomes of interest in a clearly measurable ways.

JEL classifications: O11, J16, C13

Keywords: foreign aid, gender performance, structural equation model.

1. Introduction

Gender entered the development dialogue over the period 1975-85 which came to be marked by the United Nations as the UN Decade for Women. The accumulating evidence over this period suggests that economic and social developments are not gender-neutral and improving gender outcomes has important implications both at the household and country levels, especially for the prospect of intergenerational wellbeing (Floro, 1995; Klasen, 1999). Consequentially, gender equality came to be widely accepted as a goal of development, as evidenced particularly by its prominence in the Millenium Development Goals (MDGs) and, later on, in the Sustainable Development Goals (SDGs). Aid donors also recognised that a focus on gender equality and women's empowerment in development cooperation was a means to enhance the total effectiveness of foreign aid (OECD, 1998). Following this report, and an academic interest in the gender dimensions of economic policy, there were calls for gender mainstreaming and the integration of gender sensitivity in all aid projects, programs and policies and a push for increased assistance to be pledged for it (Elgström 2000; Richey, 2000). In a study commissioned by the OECD, 65% of responding donors indicated that their aid allocations to gender programs had increased since 1999 (OECD 2007).[1] So, has the strategy of gender mainstreaming of aid succeeded in improving gender outcomes in recipient countries?

Perhaps somewhat surprisingly, the country level impact of foreign aid that targets favorable gender outcomes in recipient countries remains as yet an unexplored area. Asking the donor community to invest more in gender requires a robust evaluation of the overall and relative effectiveness of different gender-targeted interventions. Such an evaluation can also help policy makers and donors allocate aid in the most efficient way to achieve favorable gender outcomes. At present there is little empirical evidence to suggest that increasing aid inflows helps improve gender outcomes and evidence on the impact of aid on other development outcomes is also extremely mixed. Examining the evidence reveals a clear micro-macro paradox – where evaluations at the program (micro) levels have been able to establish causal linkages between aid and gender outcomes through experimental and non-experimental methodologies but these linkages have proven trickier to establish at the country (macro) level for a number of reasons (Ndikumana, 2012). In some sense, the difficulty in observing effects on country level gender

[1] Despite these efforts, foreign aid allocated for promotion of gender equality and human rights is only about 1 % of the global aid budget. According to the OECD-DAC database, of the total official aid of USD 159 billion, only USD 1.58 billion was allocated to organizations working directly for promotion of human rights and women's equality (sectors 15160 and 15170).

outcomes run into the same issues researchers face in observing consistent effects of aid on economic growth (see also Clemens, Radelet and Bhavnani, 2012; Ndikumana, 2012; Grown, Addison and Tarp, 2016). Weak additionality and diverse timelines of maturity across different types of aid result in the lack of discernible changes in macro outcomes. In particular, aid towards gender equality is spread across multiple dimensions such as health, education and rural development. Furthermore, irrespective of how we define gender performance, the concept itself is a set of complex dynamic processes that are latent in certain observables that may or may not provide accurate representations of the underlying process. Finally, while it is intuitive to understand the gender performance at the individual level within a household, an aggregated impact at the country level is complicated. The macro level impact is not merely the aggregated impact of all the foreign aid interventions: not only are there interactive effects and synergies of these multiple interventions directed towards various dimensions of female empowerment and gender equality, but different interventions trigger processes and impacts that have different period of maturation. For instance, a direct intervention in improving the economic status of women might show positive impact in a relatively short period. On the other hand, interventions directed towards changing social attitudes might take much longer to show a positive impact. Nevertheless, the estimation of macroeconomic impacts of aid towards gender equality is necessary to establish countrywide general equilibrium effects of development assistance.

This study contributes to the debate on effectiveness of foreign aid by examining the relationship between the aid allocation and outcomes for women in recipient countries at the macro level. Our main research objective is to investigate if and how gender-related aid improves gender performance in recipient countries. We define gender performance along three interrelated dimensions of women's welfare: health, access to training and employment and women's agency in the public domain. We use directly observable indicators that reflect these three dimensions to construct the latent variable of gender performance: Maternal Mortality Ratio, Adolescent Fertility Rate, and proportion of seats held by women in national parliament. We use these to measure gender performance partly because data on these indicators are the most reliable and also because they indicate developments in key areas of women's welfare. We use the factor analysis model to measure the latent variable of gender performance from these three directly observable dimensions of gender given that it does not suffer from the drawbacks associated with indexing (Klasen and Schüler 2011; Permanyer, 2013). We employ a structural equation model (SEM) to estimate the impact of the latent factors (including quantity and type of foreign aid) on latent outcome variable (gender performance in recipient

countries). The analysis is based on global cross-country data from the World Development Indicators, the World Governance Indicators and the OECDs Credit Reporting System for the year 2010. Also, to gain insights into the transferability of aid programs, we conduct a comparative analysis of which factors are more effective in having a positive impact of foreign aid on gender outcomes in the recipient countries.

There are several ways in which this study contributes to the country level aid effectiveness and gender equality literature. First, it provides a scientifically robust estimation strategy to estimate the impact of foreign aid on latent variables like gender performance. The SEM analysis lends itself to estimate the effect of foreign aid directed towards gender performance at the macro (country) level, it is also replicable at micro (program, NGOs, community-based organization) and meso (by sector or region) levels and is suited for use by donors and implementing partners. Second, it investigates which of the factors (foreign aid; economic investment in women; governance and institutional factors) are most effective in having a positive impact on gender outcomes in recipient countries. Third, it enables us to effectively analyze the ordinal data, especially the information on the degree to which aid was used for gender related activities, as reported in OECDs Creditor Reporting System. Fourth, empirical results and the factor analysis at the country level, provide the donors and program implementers with easy to interpret results in determining which factors are effective in significantly impacting favorable gender outcomes and which countries have a greater potential to impact these outcomes.

The remaining paper is structured as follows: Section 2 covers a review of earlier attempts to model relationships between aid and development outcomes, as well as the empirical literature examining this relationship. Section 3 details the empirical strategy and model used by this study. In Section 4 we discuss the data used and in Section 5 we present the results followed by Section 6 that summarizes and briefly discusses the policy implications of our findings.

2. Foreign Aid and Gender Outcomes in Recepient Countries

The aid effectiveness literature over the last two decades has largely focused on whether official development assistance has enhanced the indicators of economic and social performance in recipient countries. The evidence on this question reveals an obvious *micro-macro paradox* where specific aid-targeted interventions at the micro level tend to result in positive outcomes but the evidence at macro-level is far more mixed. Micro-level or sectoral analyses of aid-

effectiveness suggest that aid interventions have achieved positive results at the micro level, which typically means positive changes in indicators of the target sector. For instance, Michalowa and Weber (2006) find that aid to the education sector may contribute to increasing primary school enrolment in recipient countries – a result supported by Dreher, Nunnehkamp and Thiele (2008) and by Gyimah-Brempng and Asiedu (2008) who show that aid to education has a significantly positive effect on primary school enrolment and completion rates. Similarly for the health sector, Gyimah-Brempng and Asiedu (2008) show that aid to health significantly decreases child mortality in recipient countries – and again the result is supported by other studies like, Mishra and Newhouse (2009) who find that although total aid to a country has no impact on infant mortality, aid to the health sector helps to reduce infant mortality in recipient countries and Gyimah-Brempong (2015) who find that aid to health sector helps improve overall health outcomes, and that allocating more domestic resources to health further enhances the gains from aid to the health sector. In recent work by UNU-WIDER that focuses more prominently on the impact of aid on gender outcomes, Pickbourn and Ndikumana (2016) examine the gendered impact of sectoral allocation of foreign aid and find that increased aid to the health and education sectors appears to be effective in reducing maternal mortality and gender inequality in youth literacy regardless of initial conditions.

These findings, however, fail to consistently translate into positive results at the macro-level and we find evidence that is deeply polarized over the effectiveness of aid on macroeconomic performance. Some macro-studies demonstrate a positive association between aid, growth and development – for instance, Hansen and Tarp, 2000, 2001; Gomanee Morrissey, Mosley and Verschoor, 2005a, Arndt, Jones, Tarp, 2011 suggest that aid has by and large stimulated economic growth. Evidence also suggests a positive impact of aid on macro indicators of human development – for example, Gomanee Morrissey, Mosley and Verschoor (2005b) find that increased aid flows are associated with improvements in the Human Development Index. Research also suggests that aid can help improve women's participation in politics, which in turn may be crucial for shaping policies that promote women's welfare. Baliamoune-Lutz (2016) use dynamic estimation to panel data from 13 MENA countries from 2002-2010 and find that aid interventions to improve women's political involvement can help increase the number of seats held by women in parliaments.[2]

[2] Evidence on whether women's increased political participation is likely to result in more gender sensitive aid allocation seems to depend on whether the politically active women are recipients or donors. Kleemann et al. (2016) use female leadership of the ministry in those recipient countries that is responsible for aid allocation

However, there are several other studies that argue that aid interventions have entirely failed to contribute to recipient economies (Boone, 1996; Rajan and Subramanian, 2005; Easterly, 2006). There is some effort at reconciling these conflicting findings by studies that identify aid effectiveness as conditional on policy and institutional environment (Burnside and Dollar, 2000; Collier and Dollar, 2004). Campbell and Teghtsoonian (2010) suggest a shift in the governance of the development assistance model where the recipient nation directs the country's aid strategy and identifies priority areas. Ndikumana (2012) also notes that the reason why the positive results at sector level may not aggregate into visible positive outcomes at the macro level is because of structural issues in the existing development assistance model that tend to focus on sector level indicators. Notwithstanding the reasons for the differences in micro and macro-level findings, this dichotomy continues to dominate the controversy surrounding the effectiveness of foreign aid interventions.

Aside from the recent UNU-WIDER special issue on aid for gender, both micro and macro-level analyses of aid effectiveness have by and large ignored the question of how aid impacts on gender outcomes in recipient countries (Grown, Addison and Tarp, 2016). This is indeed a significant gap in the literature given the extensive evidence that links gender outcomes like inequality and empowerment with economic growth and development indicators, especially for the least developed countries. Several studies suggest that gender inequality in critical areas of the economy can affect growth and productivity outcomes. For instance, gender inequality in labour market outcomes can affect growth negatively, although the structure of the economy, its macroeconomic policy climate and cultural factors like extent of gender segregation in the labour market are seen to matter (Berik, Rodgers and Seguino, 2009). So while gender gap in labour force participation seems to have a negative effect on growth (Klasen and Lamanna, 2009), several studies indicate that gender inequality in wages is associated with higher rates of economic growth, especially for semi-industrialised export-oriented economies (Standing, 1999; Seguino, 2000; Blecker and Seguino, 2002). In contrast to this, gender inequalities in education have been seen to consistently impede economic growth (Hill and King, 1995; Esteve-Volart, 2000; Baliamoune-Lutz, 2007; Klasen and Lamanna, 2009). Klasen (1999) attributes at least some of the adverse impact of gender inequality in education on growth as the failure to utilize female talent to the same extent as that of male that is likely to lower average

from 1995-2011 as the proxy for gender gaps in education. It turns out that female leaders in recipient countries are not more generally selective than male leaders in choosing needs-based recipients. In contrast, Dreher, Gehring and Klasen, (2015) find better female political status in donor countries is correlated with higher aid flows to countries and sectors where gender gap is large.

productivity in the economy. This result is further supported by studies that find female education has a stronger positive impact on growth than male education (Kalaitzidakis, Mamuneas, Savvides and Stengos, 2001; Klasen, 2002). Improving women's access to education and training will not only improve their access to better economic opportunities but is also likely to improve their agency in household decisions and generate intergenerational benefits via an increased investment in children (Klasen, 1999; 2002).

Gender inequality clearly matters for economic growth and associated outcomes, so how can a country work towards reducing gender gaps in its economy? Evidence from a large body of literature suggests that gender outcomes are sensitive to resource allocation and targeted spending does have a favourable influence on gender outcomes. For example, investments in infrastructure and reforms to public utilities that improve access to potable water and better sanitation can reduce the time women spend on household work, giving them more time to participate in productive employment that may not only improve their personal wellbeing but may also improves outcomes for their children and contribute to long-term productivity gains (Floro, 1995; Seguino, 2000a, 2000b; Swann et al., 2007).

Overall there is sufficient evidence to suggest that significant development gains to be had from improving gender equality and empower women. It is not surprising then that the international policy governance bodies are increasingly paying attention to gender impact of aid (see World Bank, 2012; UNU-WIDER. 2014; Grown, Addison and Tarp, 2016). To the extent that development aid adds to the domestic budget available for programmes that improve gender outcomes it has the potential to improve women's welfare as well as impact positively on other aspects of the economy, notably on intergenerational outcomes. However, aid could also impede gender outcomes to the extent that it serves to increase existing gaps in resources allocated to men and women – which may empirically help explain some of the contrasting results on aid effectiveness (Richey, 2000). Given that the gender outcomes are so central to the development agenda and that evaluation of aid-effectiveness in improving these outcomes at the macro level is lacking, it seems that our enquiry into the impact of aid on gender outcomes in recipient countries is critical.

The initial impetus to track the impact of aid on gender came from the Paris Declaration on Aid Effectiveness and Gender Equality that incorporated 12 indicators and targets to monitor a country's progress in response to development assistance (Gaynor, 2007). Recent literature tends to use indices like the Gender Empowerment Measure (GEM), Gender Development

Index (GDI) and the Gender Inequality Index (GII) (UNDP, 1995; 2010). These indices focus on three interrelated domains: human capabilities, livelihoods and political agency. For example, GEM attempts to represent the extent to which women are able to actively participate in economic and political life and take part in decision-making (UNDP 1995). Index representations of development in general have been criticized due to concerns over the usefulness of aggregating across indicators: the GEM and GDI have been especially debated based on their narrowness in scope and difficulty of interpretation (Bardhan and Klasen 1999; Klasen 2006, Beneria and Permanyer 2010; Klasen and Schüler 2011; Permanyer 2011, 2013). For example, GEM is not indicative of decision making power at lower levels of government, or whether representation in parliament leads to more gender equitable policy (Klasen and Schüler 2011). Furthermore, GEM, GDI and GII, use the index approach where the weights are allocated arbitrarily without reference to theory or the characteristics of the data. Much of the data is subjective and ordinal in nature. Ordinal variables have categories as values, which cannot be treated like a continuous variable since the number allocated to the category has no intrinsic meaning which makes it different to establish any clear associations between estimated latent scores and gender performance.

In this study we propose to employ some of the observable indicators used to compute the Gender indices described above with factor analysis method to estimate the latent gender performance in recipient countries. Using the observed indicators allow us to include the key domains of gender performance without the disadvantages of the index indicators. We apply a scalable two-stage analytical process to understand drivers of favorable gender performance at the macro-level. First we use the factor analysis model to measure gender performance in recipient countries from directly observable dimensions of the latent variable: Maternal Mortality Ratio (MR), Adolescent Fertility Rate (AFR), and proportion of seats held by women in national parliament. We use these three indicators because these are reliable collected across a wide range of countries and are often externally validated. Second, in order to gain insights into the transferability of aid programs, we conduct a comparative analysis of factors (such as foreign aid, economic, investment in women and governance and institutional factors) to identify which of them are most effective in having a significantly positive impact of foreign aid on gender performance in recipient countries (refer to Table 1 for detailed definitions). The latent foreign aid factor allows us to capture both the magnitude of aid (net overseas development aid received) but also the significance of gender equality as an explicit objective, without creating an index and assigning arbitrary weights. The governance and institutional

factors are encapsulated by government efficiency, rule of law, women's agency, voice and accountability. The economic factors impacting gender performance are summarized by GDP per capita, health expenditures and improved water source. We employ a country level Structural Equation Model (SEM) to model the relationship between latent factors and latent outcomes. The model we use is replicable at the micro (program) and meso (sectoral) levels as well, is easily interpretable and of direct utility to donors and program implementers. This global cross-country analysis is based on data from the World Development Indicators, World Governance Indicators and the OECDs Credit Reporting System for the year 2010. These are presented and discussed in greater detail in Section 4.

3. Estimation Strategy and Empirical Model

Structural Equation Models (SEMs) include several traditional multivariate procedures, like factor analysis, regression analysis, discriminant analysis, and canonical correlation. They are a group of probabilistic models that attempt to draw linear cause-effect relationships across multiple specified pathways. SEM uses a variety of statistical techniques to infer these relationships, although mainly involving comparisons of covariance structures. One of the critical advantage of these models over multiple regression analysis is that they enable the investigation of the relationships between two latent constructs that are represented by a multitude of observable measures (such as the impact of the quality and magnitude of foreign aid (latent factor) directed towards gender performance (latent outcome)) (Pui-Wa and Wu 2007. SEM involves the estimation of two models – a measurement model that uses techniques such as factor analysis to establish or confirm the number of observable indicators that explain a latent construct, and a structural model in which the structural relations between the observed variables are modeled.

We start by estimating the impact of the various latent factors on gender performance as a structural equation model. A path diagram as shown in Figure 1 can graphically represent the model. The model consists of two component models, a measurement and a structural component. The measurement model measures the latent gender performance variable (*Ys*) and the various latent component factors including foreign aid (*Xs*) using observed indicators. In Figure 1 these measures are observed in the left hand side and right hand side extremes of the diagram. The structural model is indicated by the middle part of the path diagram and is the main intent of our analysis, since we are interested in how the left hand side variables of the

structural model effect the gender performance (on the right hand side) The straight single-headed arrows represent the causal relation between the latent foreign aid, economic and non-economic factors and the latent gender performance variable (*We*). The path diagram in Figure 1 corresponds to the following simultaneous equations system (see Jöreskog and Sörbom 1999).

<Figure 1>

Equation (1) below represents the measurement model for the latent components of gender performance of recipient country (ξ), where x is the vector of measures for the latent component of gender performance, Λ^x is the vector of factor loadings and δ is the vector of measurement errors associated with the respective indicators. This measurement model corresponds to the left side of the path diagram in Figure 1. The latent gender performance is denoted by **η** and is measured by the indicator vector **y** (Equ.2), where Λ^y is the vector of factor loadings and ε is the vector of measurement errors associated with y. This measurement model corresponds to the right side of Figure 1. Equ.3 is the structural equation model that indicates that the latent gender performance (η) depends on the vector of latent component (ξ), or the factors, where Γ is the vector of latent regression coefficients and ζ is the error term. The statistical significance of the latent regression coefficients thus indicates which latent component has a significant impact on gender performance of recipient countries.

$$\mathbf{x} = \Lambda^{\mathbf{x}}\xi + \delta \quad (1)$$

$$\mathbf{y} = \Lambda^{\mathbf{y}}\eta + \varepsilon \quad (2)$$

$$\eta = \Gamma\xi + \zeta \quad (3)$$

The model is suitable for estimatiing other units of analysis other than country level impact, such as at the micro or regional level by altering the observable indicators for gender performance and the latent component factors. It thus lends itself to analysis of impacts of programs at the government program, NGO or community organization level.

The estimation method used to analyses data on gender performance in recipient countries follows the Robust Maximum Likelihood (RML) method. The RML uses the following fit function

$$F(\theta) = \log \| \Sigma \| + tr(S\Sigma^{-1}) - \log(S) - k - (\bar{z} - \mu)'\Sigma^{-1}(\bar{z} - \mu) \quad (4)$$

where z is the vector of the observed responses (containing both y and x. Σ is the population matrix of polychoric correlation and S is corresponding sample polychoric correlation matrix. Central to the development of the traditional maximum likelihood estimator is the assumption that the observations are derived from a population that follows a multivariate normal distribution. This assumption is not valid when the data is ordinal. Violation of this assumption leads to wrongly estimated standard errors and chi-square. In order to correct for this we adopt RML using asymptotic covariance matrix to estimate the correct standard errors and chi-squares under the non-normality (see Appendix 1).

In reporting to the OECD, donors of aid are requested to report the targets for their development program activities. An activity is classified as gender equality focused, if it explicitly targets gender equality and women's empowerment as its principal objective or as a significant objective. A principal score of 2 is assigned if gender equality was an explicit objective of the activity and fundamental to its design - i.e. the activity would not have been undertaken without this objective. A score of 1 is assigned if gender equality was an important, but secondary, objective of the activity - i.e. it was not the principal reason for undertaking the activity. A score of 0 is assigned if, after being screened against the gender equality policy marker, an activity is not found to target gender equality. Using this type of ordinal measure for aid allocation in structural equation models requires specific techniques and procedures that differ from those employed for continuous variables (see Appendix 1).

4. Data and descriptive statistics

The analysis in this paper is based on data from the World Development Indicators that is compiled from officially recognized international sources. This global development data has been merged with the data from the OEDCs Creditor Reporting System (CRS) in constant USD 2010. We found this database has the most complete information on actual disbursement of aid and decided to use it despite criticism that it vastly under-reports the amount of aid given to developing countries by excluding aid from non-OECD donors (Tierney et al., 2011). The database includes information by donor, by recipient, by sector and by several other classifications like modality of aid (grants or loans). Aid from all donors is aggregated to obtain total aid by recipient country and by sector.

Additional data on governance is added from the World Governance Indicators (WGI), a research dataset produced by Daniel Kaufmann (Brookings Institution), Aart Kraay (World Bank Development Research Group) and Massimo Mastruzzi (World Bank Institute. Our cross-sectional SEM analysis is based on disbursement (not commitment) data for the year 2010 in constant USD 2011. A brief description of the observed indicator variables used in the SEM model along with their sources is given in Table 1. This table also discusses issues of measurement and justification of variables used for construct of latent variables.

As discussed in section 2.3, AFR, MMR and Women in Parliament (WiP: proportion of seats held by women in national parliament) are measures for the latent gender performance variable on the right hand side of the path diagram (Fig 1). The latent component constructs include Foreign Aid, Economic Factors, Investment for Women and Governance and Institutions. These are represented by observed indicators such as the latent Foreign Aid variable as represented by Net Overseas Development Aid received (% of GNI) and scores of aid directed towards gender aid in earlier section, the variable Economy is represented by GDP per capita, total health expenditure and percentage of population with access to an improved water source; the variable Investment for Women is measured by the percentage of population with access to improved sanitary facilities and finally, the latent variable of Governance and Institutions are constructed using indicators of government efficiency, rule of law and voice and accountability.

<Table 1>

Tables 2 and 3 present the descriptive statistics on the levels and the distribution of Official Development Assistance consisting of both bilateral and multi-lateral aid over various gender related activities. The majority of the DAC Aid in 2010 was disbursed to some of the poorest regions of world (Table 2, column 1), specifically Sub-Saharan Africa (41.6%) and South and Central Asia 21.5%. Other regions received a relatively smaller fraction of DAC foreign aid.

Table 2 also presents the proportion of regional bilateral aid targeting gender related projects. As discussed earlier OECDs disbursement data requests donors to indicate for each activity whether or not it targets gender equality as one of its policy objectives.[3] Scores of 2, 1 and 0 are

[3] The gender equality marker allows an approximate quantification of aid flows that target gender equality as a policy objective. In marker data presentations the figures for principal and significant objectives should be shown separately and the sum referred to as the estimate or upper bound of gender equality-focussed aid.

assigned based on whether the activity targets gender equality as its principal objective[4]; as an important, but secondary, objective of the activity; or does not target gender equality. According to the figures in Table 2 (columns 2 and 3) a relatively large proportion of the total bilateral aid was directed towards activities with *significant* (a score of 1) gender score. For example, about half of the total regional aid in Africa (North of Sahara) had a *significant* gender objective score, whereas, nearly 5% of the regional bilateral aid was directed towards activities that were reported to have a *principal* (a score of 2) gender objective score. Africa- South of Sahara, also had more than one-fourth of regional bilateral aid reporting a *significant* gender activity and 6% as *principal* gender activity. South American activities also show a substantial gender focus. However, South and Central Asia, North and Central America and the Middle East had relatively smaller proportion of gender related aid activity.

The specific nature of activities to which foreign aid was channeled is presented in Table 3. Education was the main targeted activity for the gender related bilateral aid overall, accounting for 5.46 % of total aid allocations. Production sectors were the second most preferred for the gender aid in North and Central America, South America, South and Central Asia and Far East Asia. Sub Saharan Africa's secondary focus was on commodity aid and general program assistance. The Health sector focus was more prominent for Africa (North of Sahara) and Oceania. Humanitarian aid was an important part of gender aid activities for North and Central America and Middle East. Overall however, it is reasonable to conclude that even though gender is an important component of aid it is not a significant proportion of its principle objective and is mostly included as a secondary objective.

<Table 2>

<Table 3>

An activity can have more than one principal or significant objective. Therefore, total amounts targeting the different objectives should not be added-up to avoid double counting.

[4] Activities assigned a principal objective score should not be considered better than activities assigned a significant objective score, as donors that mainstream gender equality - and thus integrate it into their projects across a range of sectors - are more likely to allocate the marker score significant to their aid activities.

5. Results from the Structural Equation Models

This section presents the main results of the SEMs for the impact of foreign aid on gender performance in recipient countries and determines which of the latent factors have a significant impact on gender indicators. We first examine the results from the measurement model, which specifies how the latent variables are measured in terms of the observed variables and describes their reliability and validity. Table 4 provides the estimated parameters of the measurement model for gender performance and factors of gender performance.[5] The coefficients indicate the linear causal relationship between the observed variables and the latent factors. The statistical significance of the coefficient indicates that the observed variables dependably measure the latent variables. All but one of the observable variables used to measure the latent variables are significant at the 1% level, which suggests they are very reliable indicators of the latent constructs. The only exception is the Maternal Mortality Rate, which is significant at the 5% level, which means it is still a fairy good indicator to use in the construct of gender performance.

Table 5 presents the parameter estimates and some of the fit indices for the structural model of gender performance. These coefficients are standardized and may thus be interpreted on both significance and magnitude. The fit of the structural equation model can be assessed by examining the Satorra-Bentler scaled chi-square goodness of fit index, the Root Mean Square Error of Approximation (RMSEA) and the Normed Fit Index (NFI). The RMSEA considers the error of approximation in the population and finds how well the model, with unknown but optimally chosen parameter values, fits the population covariance matrix. The NFI is a measure that rescales chi-square to compare a restricted model with a full model using an arbitrary baseline null model. The fit indices reveal that the model has a good approximate fit, which implies that our estimates are reliable.

[5] In addition to the observed indicators used for estimating the results presented here, we have also estimated the following other observed indicators to measure the latent factors: Gender Performance: CPIA gender equality, social inclusion, contraceptive prevalence, female legislators local, fertility rate; Foreign Aid: gender aid principal, total sector aid for gender; Economy: labour force participation rate (female), ratio of female to male labour force, public expenditure on education, ratio of female to male primary and secondary education, girls to boys primary education ratio; Investment for Women: improved water source for women; Macro Stability: inflation; Governance and institutional factors: property rights, control corruption, political stability, regulatory quality; and interaction between Governance and foreign aid.. These results are available upon request.

These results show that at the macro level foreign aid does not have a significant impact on improving the indicators used to measure gender performance in a country. This result is not surprising given that the scale and quality of foreign aid targeted at women was limited. In spite of best intentions, a very small proportion of gender related intervention was a principal intervention strategy where gender empowerment or related issues were the main objective. For the majority of the aid interventions, gender was relegated to a secondary place. Furthermore, our evidence shows that none of the latent explanatory variables used in the model have a significantly positive impact on gender indicators of aid recipient countries. In fact, we find that investments in improved sanitation are seen to have a negative impact on gender performance. This is an unexpected results as improved sanitation measures are likely to help women (along with the general population) – but this result perhaps suggests that interventions that do not address women's concerns more directly are not only ineffectual in improving their overall status, but could actually be detrimental to them. It is also plausible that inadequate sanitation facilities (quantity and quality) are generally ineffectual in changing habits or in influencing behavior, especially with respect to work and education (Dolan et al. 2014; Garikipati and Boudot, 2016). Our results seem to suggest that to successfully change gender status quo, interventions need to more directly target the observable variables that represent women's status in recipient countries – i.e., to be successful, interventions may need to directly aim to improve maternal mortality rate or enhance women's participation in government. Data on such specific investments at the country level are difficult to find and it is not evident that any of the reputed data agencies are keen on gathering the relevant information. Unless data availability in this area improves, it is unlikely that the links between aid, investment in women and outcomes for women can be established in a statistically robust manner.

On average women in many developing countries walk for about 6 kilometers each day to collect water (UNFPA 2002). Limited access to water is often linked with their limited access to land (IFAD, 2001a). Thus, water has been recognized as one of the causes of the lower participation of women in economic activity (IFAD, 2001b). Nearly, 37 per cent of the world's population lacks access to adequate sanitation (UN, 2015). Women and girls, pay the heaviest price for poor sanitation due to lack or freedom and safety in accessing communal defecation fields and loss in school enrolment and attendance plus taking care of those who fall sick due to inadequate sanitation hygiene (Unicef, 2016). While sanitation access has special benefits for women, even a basic toilet involves a significant amount of investment and can be used by a limited number of individuals.

There are other limitations to our analysis. One of the major challenges we faced when estimating our results was that the sample size is relatively small at 100. Secondly, the data is limited for various variables which constraints the number of observed indicators that can be used for estimation in the measurement model. It was nearly impossible to do a panel analysis because even if some of the variables are fairly well reported for a few years, other variables have a large number of missing values, which results in the observation (country) being dropped completely.

<Table 4>

<Table 5>

Our results are supported by evaluation studies that examine donor strategies to improve gender outcomes in recipient countries. When allocating aid to improve gender outcomes in recipient countries, donors may choose to target specific gender outcomes by supporting direct investments for women or they may choose the approach of mainstreaming gender by embedding a gender perspective at policy level across activities (Brouwers, 2013). Most of the foreign aid that supports gender is in the form of mainstreaming where a gender outcome is not the primary objective. Recent evaluations suggest that mainstreaming as a strategy has largely failed (African Development Bank, 2011; Koppell and Grown, 2012; Brouwers, 2013; Grown, Addison and Tarp, 2016). The suggestion here is that unless aid is directly invested to improve targeted gender outcomes we are unlikely to see an impact of aid on these indicators.

A study by the African Development Bank (2011) identifies some of the contributing factors for the failure of the gender mainstreaming strategy as insufficient expertise, misallocation of aid, lack of monitoring and evaluation of results and the difficulties with broadening the scope of gender aid. Most donors still prefer to fund specific sectors, especially education and healthcare and the ideas of mainstreaming become fuzzy as gender norms are not adequately imbued into various contexts (Grown, Addison and Tarp 2016). Furthermore, research also suggests that when allocating aid to sensitive sectors like education and health, donors care less about gender equality (Dreher, Gehring and Klasen, 2015; Breuning, 2016). Furthermore, Dreher *et al.* (2015) also find that if inequality persists in recipient countries regardless of large aid flows, donors continue to donate large amount – suggesting that absence of punitive sanctions may weaken the incentive to comply with policy commitment on gender outcomes.

A study by Koppell and Grown (2012) suggests that the strategy of mainstreaming is likely to have the most durable results only when aid is used to engage with businesses to improve women's access to economic opportunities (see also Grown, Addison and Tarp, 2016).

6. Concluding Comments

Women's empowerment and gender equality have gained tremendous momentum in the recent development discourse. The association of women's agency with human development is heralded by the development literature and for many it is the nearest thing there is to a silver-bullet for human development (World Bank, 2012; Klugman *et al.*, 2014). This association between women's agency and human development was the main reason behind the call for gender mainstreaming in foreign aid projects and donor commitment to increase aid allocations to gender programs (OECD 2007). Asking the donor community to invest more in gender performance of recipient countries requires a robust evaluation of the overall and relative effectiveness of different gender-targeted interventions. So far such an evaluation at the country level has proven difficult mainly due to the methodological issues involved.

One of the difficulties is that gender performance itself is a latent variable that is not itself observable but requires to be derived from observed indicators of performance. Finding robust indicators that would usefully estimate gender performance of recipient countries is in itself a challenge. In this study, we use Structural Equation Method to measure the impact of foreign aid on gender performance of recipient countries. This is an appropriate method for our analysis because the variable of interest – gender performance – is a latent variable and many of the underlying influences are also unobservable. We use three widely used indicators that are effective in quantifying women's agency at the country level: Adolescent Fertility Rate, Maternal Mortality Rate and proportion of seats held by Women in Parliament. These three indicators have been used in creation of various gender indices – but we use them directly thus overcoming any shortcomings of index measures. We further use other factors to construct latent determinants of gender performance in recipient countries, which includes Foreign Aid, the state of the Economy, Investment for Women, Governance and Institutions.

While project or sector level positive impact and empowerment of women is desirable, most donors and governments would prefer a long-term change to it. Our results confirm that if we want foreign aid to obtain a significant change in gender outcomes at the macro-level, we need

a much larger allocation and investment of aid. The situation is further perpetuated by weak additionality, diverse timelines of maturity and impact across different types of aid result and complexity of the dynamic process of empowerment and interactive effects and synergies. If we intend to successfully monitor the change in the gender status quo, interventions need to more directly target the observable variables that represent women's status in recipient countries. For example, to be successful interventions may need to directly aim to improve maternal mortality rate or enhance women's participation in government. Unless data availability improves, it is unlikely that the links between aid, investment in women and outcomes for women can be established in a statistically robust manner at the macro-level.

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TABLES

TABLE 1

Description of observed indicators to measure latent variables (add mean standard deviation)

(1) *Latent variables and associated observed indicators*	*(2)* *Description of the Variable*	*(3)* *Sources*
1.Gender Performance of Recipient Country		
Adolescent Fertility Rate	Adolescent fertility rate is the number of births per 1,000 women ages 15-19 in the recipient country.	United Nations Population Division, World Population Prospects.
Maternal Mortality Ratio	Maternal mortality ratio is the number of women who die during pregnancy and childbirth, per 100,000 live births. The data are estimated with a regression model using information on fertility, birth attendants, and HIV prevalence.	Catalogue Sources World Development Indicators Trends in Maternal Mortality: 1990-2010. Estimates Developed by WHO, UNICEF, UNFPA and the World Bank.
Women in Parliament	The proportion of seats held by women in national parliament in the single or lower chamber.	Inter-Parliamentary Union (IPU)
2. Foreign Aid		
Net Overseas Development Aid received (% of GNI)	Net official development assistance (ODA) consists of disbursements of loans made on concessional terms (net of repayments of principal) and grants by official agencies of the members of the Development Assistance Committee (DAC), by multilateral institutions, and by non-DAC countries to promote economic development and welfare in countries and territories in the DAC list of ODA recipients. It includes loans with a grant element of at least 25% (calculated at a rate of discount of 10%).	Development Assistance Committee of the Organisation for Economic Co-operation and Development, Geographical Distribution of Financial Flows to Developing Countries, Development Co-operation Report, and International Development Statistics database. Data are available online at: www.oecd.org/dac/stats/idsonline. World Bank GNI estimates are used for the denominator.
Gender Aid	A 'principal score' of 2 is assigned if gender equality was an explicit objective of the activity and fundamental to its design - i.e. the activity would not have been undertaken without this objective. A "significant" score 1 is assigned if gender equality was an important, but secondary, objective of the activity - i.e. it was not the principal reason for undertaking the activity. A "not targeted" score (0) is assigned if, after being screened against the gender equality policy marker, an activity is	Development Assistance Committee (DAC) Creditor Reporting System (CRS), disbursement data (since 2009) on aid in support of gender equality.

	not found to target gender equality. Activities assigned a "principal objective" score should not be considered better than activities assigned a "significant objective" score, as donors that mainstream gender equality - and thus integrate it into their projects across a range of sectors - are more likely to allocate the marker score "significant" to their aid activities.	
3. Economy		
GDP per capita Health Expenditure (as % of GDP) Improved Water Source	Gross Domestic Product per capita Health Expenditure as a percentage of Gross Domestic Product Access to an improved water source refers to the percentage of the population with reasonable access to an adequate amount of water from an improved source, such as a household connection, public standpipe, borehole, protected well or spring, and rainwater collection. Unimproved sources include vendors, tanker trucks, and unprotected wells and springs. Reasonable access is defined as the availability of at least 20 litres a person a day from a source within one kilometre of the dwelling.	World Development Indicators
4. Investment for women		
Access to Sanitation Facilities	Access to improved sanitation facilities refers to the percentage of the population with at least adequate access to excreta disposal facilities that can effectively prevent human, animal, and insect contact with excreta. Improved facilities range from simple but protected pit latrines to flush toilets with a sewerage connection. To be effective, facilities must be correctly constructed and properly maintained. Access to sanitation facilities is a good measure of investment for women as it is associated with their improved participation in education and paid work. Absence of sanitation also has a disproportionately negative impact on women.	World Health Organization and United Nations Children's Fund, Joint Measurement Programme (JMP) (http://www.wssinfo.org/)
5. Governance and institutions		
Government Efficiency	Captures the perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.	The World Governance Indicators are a research dataset produced by Daniel Kaufmann (Brookings Institution), Aart Kraay (World Bank Development Research Group) and Massimo Mastruzzi (World Bank Institute).
Rule of Law	Captures the perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.	World Governance Indicators

Voice and Accountability	Captures perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.	World Governance Indicators
Aid for Women's Agency	Aid donors are requested to indicate for each activity whether it targets gender equality and women's empowerment as one of its main policy objectives. An activity is included if gender equality and women's empowerment was an explicit objective and fundamental to its design - i.e. the activity would not have been undertaken without this objective. We use this variable here (rather than under Foreign Aid) because initiatives that aim to strengthen women's agency work via institutions of governance and accountability. DAC data is presented using target markers thus avoiding any double counting.	Development Assistance Committee (DAC) Creditor Reporting System (CRS), disbursement data (since 2009) on aid in support of gender equality.
Total Sample Size	100	

TABLE 2

Regional bilateral aid as percentage of total bilateral aid, and regional gender aid as percentage of the regional total bilateral aid (disbursements in USD million in constant USD 2011)

Regions	***Total Aid by DAC in 2010*** *(in constant USD year 2011) disbursements* ***(percentage of total aid)***	***Total Aid to Gender*** *(in constant USD year 2011) disbursements* ***(percentage of total aid to the region)***	
	Column 1	*Promoting Women's Agency* *Column 2*	*Gender is a significant target* *Column 3*
Africa - North of Sahara	1693 (2.49)	74 (4.37)	832 (49.16)
Africa - South of Sahara	28292 (41.59)	1725 (6.10)	7747 (27.38)
North & Central America	5048 (7.42)	207 (4.10)	1080 (21.41)
South America	2309 (3.39)	156 (6.74)	875 (37.88)
Middle East	5113 (7.52)	99 (1.94)	806 (15.77)
South & Central Asia	14589 (21.45)	647 (4.43)	3359 (23.02)
Far East Asia	5771 (8.48)	270 (4.69)	1977 (34.26)
Europe	3223 (4.74)	111 (3.44)	681 (21.12)
Oceania	1986 (2.92)	69 (3.45)	662 (33.31)
Total	**68022 (100)**	**3357 (4.93)**	**18019 (26.49)**

Source: Total aid data accessed from OECD QWIDS database, and total gender aid accessed from OECD StatExtracts database.

TABLE 3

DAC bilateral gender aid by region for different sub-categories for 2010, disbursements in USD million in constant USD 2011

(percentages of total aid)

Regions	***Education***		***Health***		***Production Sectors***		***Commodity aid / Gen. Prog. Ass.***		***Humanitarian Aid***	
	Principal	*Significant*	*Principal*	*Significant*	*Principal*	*Significant*	*Principal*	*Significant*	*Principal*	*Significant*
Africa - North of Sahara	31.6 (1.87)	418.4 (24.72)	0.5 (0.03)	58.8 (3.47)	3.0 (0.18)	42.7 (2.52)	- -	3.5 (0.21)	0.4 (0.02)	3.8 (0.22)
Africa - South of Sahara	304.2 (1.08)	1468.7 (5.19)	168.4 (0.60)	851.9 (3.01)	292.0 (1.03)	611.7 (2.16)	321.0 (1.13)	1206.1 (4.26)	24.4 (0.09)	352.8 (1.25)
North & Central America	20.5 (0.41)	120.1 (2.38)	17.6 (0.35)	37.5 (0.74)	38.5 (0.76)	123.6 (2.45)	0.0 (0.00)	2.3 (0.05)	3.2 (0.06)	242.6 (4.81)
South America	25.8 (1.12)	204.4 (8.85)	12.3 (0.53)	33.3 (1.44)	17.3 (0.75)	121.1 (5.24)	0.1 (0.00)	1.2 (0.05)	3.6 (0.15)	17.0 (0.74)
Middle East	12.6 (0.25)	193.7 (3.79)	1.4 (0.03)	33.7 (0.66)	1.3 (0.03)	28.2 (0.55)	0.5 (0.01)	4.4 (0.09)	5.9 (0.11)	91.3 (1.79)
South & Central Asia	190.2 (1.30)	496.5 (3.40)	25.1 (0.17)	331.3 (2.27)	49.9 (0.34)	342.6 (2.35)	89.4 (0.61)	59.9 (0.41)	64.2 (0.44)	295.7 (2.03)
Far East Asia	28.0 (0.49)	448.2 (7.77)	12.2 (0.21)	138.9 (2.41)	19.9 (0.34)	248.2 (4.30)	6.4 (0.11)	64.6 (1.12)	5.3 (0.09)	37.7 (0.65)
Europe	2.3 (0.07)	131.4 (4.08)	0.4 (0.01)	2.7 (0.09)	5.0 (0.15)	29.5 (0.91)	- -	0.7 (0.02)	1.7 (0.05)	4.2 (0.13)
Oceania	11.4 (0.58)	229.3 (11.55)	9.0 (0.45)	96.3 (4.85)	0.6 (0.03)	25.9 (1.30)	0.2 (0.01)	14.4 (0.73)	0.4 (0.02)	11.8 (0.59)
Total	**626.5 (0.92)**	**3710.8 (5.46)**	**246.9 (0.36)**	**1584.4 (2.33)**	**427.5 (0.63)**	**1573.4 (2.31)**	**417.7 (0.61)**	**1357.1 (2.00)**	**109.0 (0.16)**	**1056.8 (1.55)**

Source: Data collected from OECD StatExtracts database, category: Aid projects targeting gender equality and women's empowerment (CRS).

TABLE 4

Estimated parameters of the measurement model for gender performance and factors of gender performance

Latent Factors / *Observed indicators*	*Gender Performance*	*Foreign Aid*	*Economy*	*Investment for women*	*Governance and Institutions*
Adolescent Fertility Rate	0.54 ***	-	-	-	-
Maternal Mortality Ratio	0.17 (0.79) **	-	-	-	-
Women in Parliament	0.42 (0.09)***	-	-	-	-
Net Overseas Development Aid received (% of GNI)	-	0.8 (0.09)***	-	-	-
Gender Aid	-	0.42 (0.09)***	-	-	-
GDP per capita	-	-	0.55 (0.14)***	-	-
Health expenditure (% of GDP)	-	-	0.16 (0.08)***	-	
Improved water source (% of population with access)	-	-	0.27 (0.13)***	-	-
Improved sanitation facilities (% of population with access)	-	-	-	0.83 (0.09)***	-
Government efficiency	-	-	-	-	0.94 (0.07)***
Rule of law	-	-	-	-	-0.22 (0.05)***
Voice and accountability	-	-	-	-	0.96 (0.075)***
Aid for Women's Agency	-	-	-	-	0.69 (0.09)***

Notes: *** Significant at the 1% level, ** at the 5% level. T-statistics in parentheses. Analysis based on 100 countries.

TABLE 5: Estimated parameters for the Structural Model for Latent Factors and Gender Performance

Latent Factors of Gender Performance	*Coefficients (standard errors)*
Foreign Aid	0.44 (0.39)
Economic	-0.14 (0.21)
Investment for women	-0.77 (0.33)**
Governance and institutions	0.28 (0.20)
Model Fit	
Satorra-Bentler scaled Chi-Square	$\chi^2 = 1291$ df= 78
RMSEA	0.062
NFI	0.95

Notes: ** Significant at the 5% level. Standard error in parentheses. Analysis based on 100 countries.

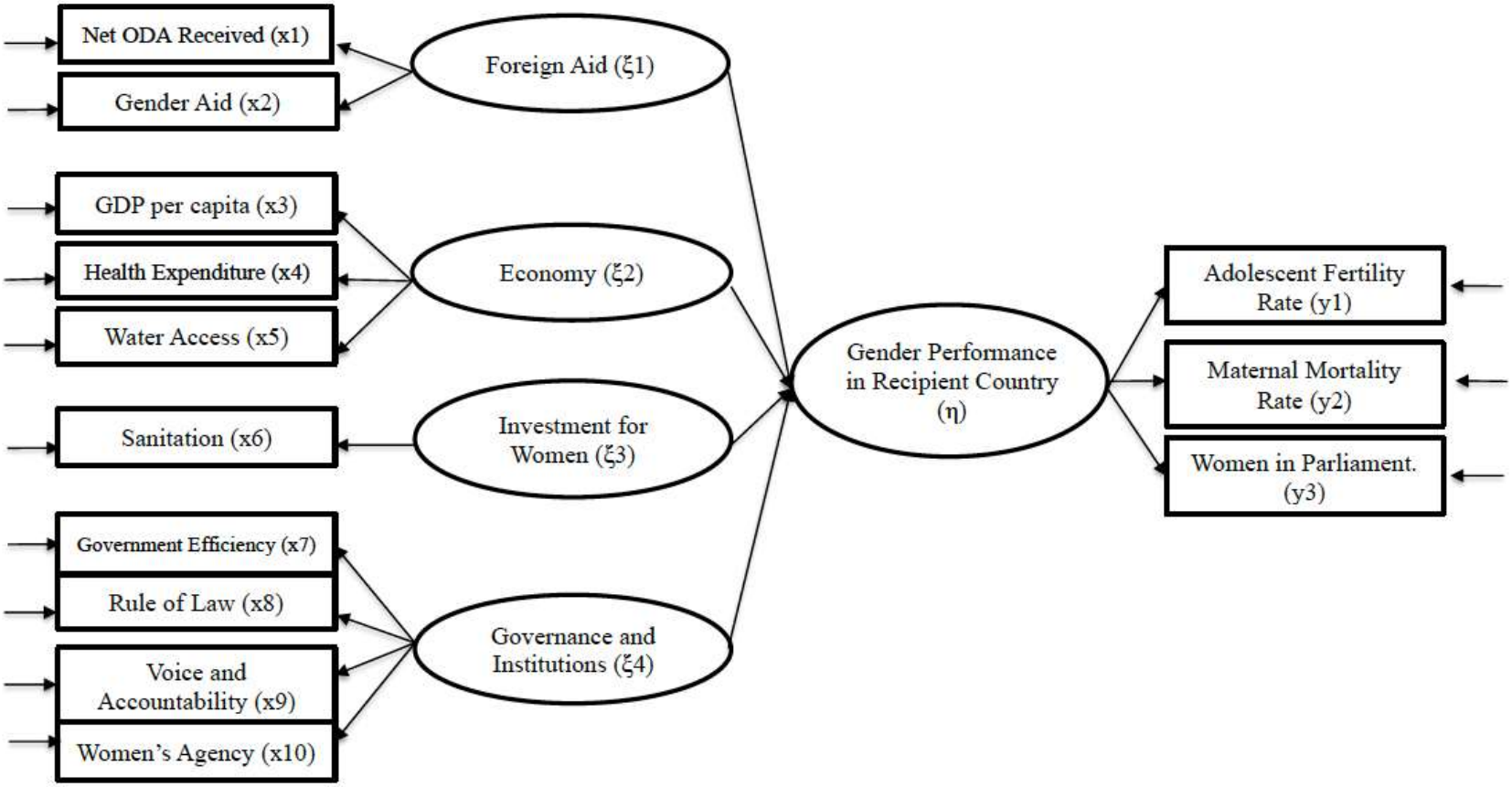

Figure 1: Path diagram for the Impact of Foreign Aid on Gender Performance in Recipient Country

APPENDIX (may be placed online)

Factor Analysis using ordinal variables

Observed indicators of the latent construct, such as an indicator of whether foreign aid is directed towards female empowerment, are in discrete ordinal form and hence by nature do not lend themselves to standard factor analysis modelling. Moreover, longitudinal data tend to have measurement errors that are correlated over time due to specific factors like memory or other retests effects. It is thus important to consider models that adequately deal with correlated measurement errors. We employ a latent response distribution function to carry out factor analysis of the determinants of foreign aid towards outcomes for women in recipient countries.

A latent response distribution is an unobserved univariate continuous distribution that generates an observed ordinal distribution (Jöreskog 2002). That is, for each ordinal variable say *y*, we assume that there is an underlying continuous variable *y** that represents the same attitude of the ordinal responses to *y* and is assumed to have a range from -∞ to +∞. It is this underlying variable *y** that is used in structural equation modelling, and not the observed ordinal variable *y*. The underlying variable assigns a metric to the ordinal variable. The relationship between an underlying continuous variable *y** and an observed ordinal variable *y* is formalized as expressed below.

If y has m categories labelled 1, 2, …, m, the relationship between y and y* is

$$y = i \Leftrightarrow \tau_{i-1} < y^* < \tau_i, \qquad i = 1, 2, \ldots, m$$

where $-\infty = \tau_0 < \tau_1 < \tau_2 < \ldots < \tau_{m-1} < \tau_m = +\infty$ are 'threshold values' as parameters defining the categories *i*. With m categories, there are *m-1* threshold parameters $\tau_1, \tau_2, \ldots, \tau_{m-1}$.

In order to estimate the threshold parameters, we make an assumption on the distribution of *y**. Since *y* is ordinal, the distribution of *y** is determined only up to a monotonic transformation and a standard normal distribution with density function $\phi(u)$ and distribution function *Φ(u)* is chosen for *y** . The probability of a response in category *i* is given by

$$p_i = P(z = i) = P(t_{i-1} < z^* < t_i) = \int_{t_{i-1}}^{t_i} \phi(u)du = \Phi(t_i) - \Phi(t_{i-1}),$$

where $\tau_i = \Phi^{-1}(\pi_1 + \pi_2 + ... + \pi_i), \qquad i = 1,...,m-1,$

πi's are unknown population probabilities of a response in category *i* and can be estimated consistently by the corresponding percentage *pi* of observed responses in category *I* such that

$$\hat{\tau}_i = \Phi^{-1}(p_1 + p_2 + ... + p_i), \qquad i = 1,2,...,m-1.$$

where ($p1 + p2 + ... + pi$) is the proportion of cases in the sample responding in a given category *i* or lower. We estimate $\hat{\tau}_i$ as the maximum likelihood estimator of *πi* based on the univariate marginal sample data.

*Ranjula Bali Swain, Professor, Misum, Stockholm School of Economics and Department of Economics, Södertörn University, Stockholm, Sweden. Email: Ranjula.Bali@hhs.se. Supriya Garikipati, Reader, University of Liverpool Management School, United Kingdom. Email: S.Garikipati@liv.ac.uk.
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