Child Marriage, Human Development and Welfare
To my family
Child Marriage, Human Development and Welfare
Using Public Spending, Taxation and Conditional Cash Transfers
as Policy Instruments
Abstract


The theme of this thesis is to analyze the impact of policy interventions such as financing human development (HD), tax reform and conditional cash transfer programmes, under the framework of growth and sustainable development. These policy instruments are evaluated through the application of both partial and general equilibrium models, and the last paper concentrates on developing regional social accounting matrices (SAMs) as a core database for spatial general equilibrium modelling.

Essay 1: Trade-offs in Achieving Human Development Goals for Bangladesh investigates the benefits and costs associated with alternative investment financing options for achieving HD goals by applying the MAMS (Maquette for Millennium Development Goals Studies) model. We find that full achievement of these goals would have led to a GDP loss that would have been significantly larger in the domestic borrowing scenario than in the tax scenario. The tax-financing alternative is thus the better option for financing large development programs. In terms of public spending composition, we find that, under some circumstances, a trade-off arises between overall Millennium Development Goal (MDG) progress and poverty reduction.

Essay 2: Welfare impact of broadening VAT by exempting Small-Scale food markets: The case of Bangladesh analyses the welfare impacts of different VAT reforms. A general and uniform VAT on all commodities is preferred as it is more efficient and less administratively costly. However, due to equity concerns, food is normally exempted from VAT. On the other hand, exemptions on food mean that an implicit subsidy is provided to high-income households. Hence, we analyze a broad-based VAT regime with a high threshold that excludes small-scale operators (where the low-income households buy their products most, including food) and the simulation result shows that welfare improves for the low-income households.

Essay 3: Effect of Girls’ Secondary School Stipend on Completed Schooling and Age at Marriage: Evidence from Bangladesh estimates the effect of a conditional cash transfer programme on education and age at marriage. We apply both difference in differences (DiD) and regression discontinuity methods to evaluate the impact of the policy instrument. Our estimation results show that the girls in the treatment group who were exposed to the programme had a higher average number of completed years of schooling and also delayed their first marriage compared to the girls in the control group. We also show that the DiD approach might produce a biased result as it does not consider the convergence effect.

Essay 4: Estimation of Multiregional Social Accounting Matrices using Transport Data proposes a methodology for estimating multiregional SAMs from a national SAM by applying the cross-entropy method. The methodology makes possible the construction of regional SAMs that are consistent with official regional accounts and minimize deviations from transport data.

Keywords: HDs, Growth, MAMS, VAT Reform, Equity, Welfare, Secondary Stipend, Education, Age at Marriage, Multiregional Social Accounting Matrix, Cross-Entropy Estimation.

Yeasmin Sayeed, Economics, Örebro University, SE-701 82 Örebro, Sweden, yeasmin.sayeed@oru.se
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With regards. Yeasmin Sayeed, Örebro
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1. Introduction

1.1 Background and Motivation

Investment toward human development (HD) and growth is the core of a sustainable development process. Sustainable development will help the development needs of the poor and most vulnerable groups. Nowadays, HD is increasingly seen as the ultimate development goal, instead of economic growth (Ranis and Stewart 2005). According to Ray (1998), development is not just about income. Rather the objective of development relates to the freedom enjoyed by the people involved. However, the individual’s freedom is framed by economic, social and political arrangements (Sen 1999).

A nation’s stock of human capital and its growth as part of development will partly depend on the appropriate policy measures taken for education, health etc. According to decomposition analysis on growth, “human capital” i.e., people’s abilities, knowledge and skills, contributes 15-30 percent and physical capital roughly 20 percent (Hsieh and Klenow 2010). In the 1980s, the return on knowledge and skills in the United States was about 14 times that on physical capital (Soubbotina 2004). Therefore, countries invest in building up human capital by providing education and training. Analyzing and evaluating the causes and effects of different policy instruments applied for growth and development purposes have remained a major research interest for development economists.

Growth is associated with reducing poverty and improving overall welfare but improvements in welfare might not always lead to better distribution and equity. Income inequalities between the richest and poorest groups are still a major concern. Hence, the government, international financial institutions and donors are required to play an active role in designing and implementing new development strategies to ensure social inclusion.

Some of the questions that need to be answered in this context are as follows: What is the most cost-efficient alternative for investment in growth and HD? Which tax reform would provide better equity and improve welfare? How much of an effect would a given policy intervention have? Evaluating appropriate and effective policy instruments for growth, welfare and development is challenging and requires intensive and extensive analysis. This thesis makes both general and partial impact analyses of
policy interventions such as financing accelerated investment, tax reform and conditional cash transfers instruments generally adopted for developing countries. The effectiveness and implications of these policy instruments are analyzed in the following contexts:

1.1.1 Millennium Development Goals
In year 2000, the United Nations Millennium Summit Declaration adopted eight Millennium Development Goals (MDGs) to be achieved by the year 2015. The purpose of the MDGs was to eradicate extreme poverty and hunger and improve the HD indicators in terms of education, gender equality, child mortality and maternal health, among others. Some regions were able to get quite close to the overall targets, while others, such as Africa, were unable to do so. For many Latin American countries – where the initial conditions were already less severe than in most other developing countries– progress was impressive. However, the progress made by some African countries was also impressive, despite the fact that they started with unfavourable initial conditions. In southern, east, central and west Africa the proportion of people living below $1.25 a day decreased, on average, from 56.5 percent in 1990 to 48.5 percent in 2010. For example, by 2010, Uganda had already achieved the target of halving the proportion of the population living below the national poverty line from 56.4 percent to 24.5 percent. The Asia-Pacific region has made dramatic strides, and between 1990 and 2015 the proportion of people living below $1.25 per day decreased, on average, from 53 percent to 12 percent. However, standing at the end of the deadline year, the general consensus is that the overall progress towards MDG achievement is still limited and heterogeneous, especially among the low-income countries (World Bank 2012).

World leaders have since been working on formulating a new set of Sustainable Development Goals (SDGs) that include some of the MDGs and extend beyond them, including an end to extreme poverty, putting sustainable development at the core, and other elements. The targets for the second phase are set for the year 2030 (United Nations 2013). Achieving the MDGs (and SDGs) by the year 2015 and beyond requires interventions to accelerate investment expenditure. The question is how low-income countries should mobilize domestic resources (taxation, domestic borrowing, etc.), while additional resources such as aid can be supportive to reforms as well.
Comparing such alternatives is crucial to determining the lowest cost of reaching the goals. Another question that arises is where to channel these limited resources: towards growth and poverty reduction or towards HD indicators? Investment in infrastructural development would accelerate GDP growth, necessary for meeting the goal of reducing poverty. Higher income facilitates the achievement of HD objectives (Ranis and Stewart 2005; Paternostro et al. 2007). An indirect effect of growth is that it generates domestic resources that can be allocated towards HD. However, Qureshi (2008) argued, based on evidence from Pakistan, that high economic growth might not result in better HD indicators. This is contradictory to the “trickle down” approach, which argues that the economically disadvantaged segment of society ultimately reaps the long-term benefits of economic growth. Instead, it is proposed, high spending on education and health would yield better results, even if the economy grew at a relatively lower rate.

In essay 1, we study both the impact of financing alternatives aimed at achieving HD and the trade-offs between investing in growth and respectively HD, for Bangladesh.

1.1.2 Taxation, Equity and Welfare

Increases in domestic revenue are an important policy priority when it comes to efforts to stimulate growth and HD and eradicate poverty. Taxation is central to any domestic resource mobilization strategy (Vos et al. 2007). However, there are several problems related to implementing an efficient tax policy for any developing country. First, most workers in these countries are typically employed in agriculture or in small, informal enterprises. Workers in the informal sector are not normally paid a fixed wage; their earnings fluctuate, and many are paid in cash, “off the books”. The base for an income tax is therefore hard to calculate. On the other hand, workers in these countries do not normally spend their earnings in formal markets that keep accurate records of sales and inventories. As a result, raising revenue through either income taxes or consumption taxes can only play a restricted role in developing countries (Tanzi and Zee 2001). Second, it is difficult to create an efficient tax administration without a well-educated and well-trained staff.

In the context of tax reform, a consumption tax is often preferred to income tax since it is believed that income taxes on either labour or capital reduce the taxpayer’s ability to save. On the other hand, consumption tax has been argued to be inherently more regressive than income tax (Tanzi
and Zee 2001). However, currently, value-added tax (VAT), a consumption tax, is a major source of revenue in many developing countries.

When the government changes the structure of taxation, who suffers the incidence of taxation? Efficiency (whether the tax diminishes the price distortions between consumption and production decisions (Acosta-Margain 2013)) and equity (whether the tax is fair to everybody) are central issues in tax reform analysis. There is a trade-off between exemptions and efficiency, with more exemptions implying less efficiency. A general and uniform VAT system applied to the consumption of all goods and services is more efficient and less administratively costly but is often regressive. Therefore, due to equity concerns, the prevalence of the informal sector and for many other reasons, there exist many forms of tax exemptions. VAT exemptions for basic consumption goods, such as food, that constitute a proportionally larger share of low-income households’ budgets, can be used to make a consumption tax progressive. Piggott and Whalley (2001) showed that such a reform in an economy with an informal sector could be progressive if low-income households were able to increase their purchases in the informal sector and in that way avoid the tax.

On the other hand, more exemptions also lead to less revenue that can be used for expenditure targeting low-income households. How the trade-off between exemptions and targeted expenditure is balanced will depend on the government’s capacity to design well-targeted programmes. As a piecemeal analysis, in essay 2 we analyze the distributional and welfare impacts of reforms to the existing VAT system in Bangladesh in which we exclude the small-scale food market.

1.1.3 Conditional Cash Transfer (CCT) Programmes for Women’s Development

The third objective set by the MDGs to be achieved by the year 2015 aimed at promoting gender equality and empowering women. Schooling and education, as important development objectives, are considered to be the most effective means of emancipating women from economic and other social hindrances, and also narrowing down the gender gap. However, the availability of school facilities does not always lead to more enrolments and education, especially for girls above the primary level. A disproportionate number of girls are still not in school in many developing countries. There is a high drop-out rate for girls at the secondary level. Early marriage is one of the reasons behind this. Any form of marriage
before the age of 18 is considered by UNICEF (2005) as early/child marriage, and is being recognized as a violation of human rights by an increasing number of countries (Godha et al. 2013). Child marriage, and particularly girls’ early marriage, is associated with lower schooling, lower social status and higher rates of maternal mortality and domestic violence (Field and Ambrus 2008). Also, early child bearing is often associated with early marriage, as there exist strong social sanctions, especially in South Asia, against out-of-wedlock childbearing (Caldwell 2005). Osili and Long (2008) studied the influence of female education on fertility after the introduction of universal primary education (UPE) in Nigeria, and suggested that increasing female education by one year reduced early fertility by 0.26 births. Hence, many “gender-targeted” instruments are aimed at keeping girls in school. Some of these instruments are financial and some are non-financial, such as building female-friendly schools. Examples of financial instruments include the conditional cash transfer (CCT) programmes that have been applied in many developing countries. These programmes reduce the direct and indirect costs of girls’ schooling and induce them to attain a higher level of education. The ultimate objectives of these CCTs are to keep girls away from work, to delay marriage, to stop early child bearing, and other related goals. Female education can reduce fertility through knowledge and the effective use of contraceptive methods, and/or by increasing female autonomy and bargaining power when it comes to having children.

Ikamari (2005) estimated the relationships between women’s education and early marriage and found a statistically significant and strongly positive effect of education on women’s age at first marriage in Kenya. There are also studies on the consequences of early marriage on mental health, fertility, and other outcomes (Gage 2013; Godha et al. 2013). Gage (2013) found an association between child marriage and increased odds of suicidality in Ethiopia. The impact of a girl’s early marriage on her secondary education was studied by Field and Ambrus (2008). They estimated that each additional year for which marriage is delayed is associated with an additional 0.22 years of schooling.

The Female Secondary Stipend Programme (FSSP), introduced in Bangladesh in 1994, was one of the pioneers of such programmes. Later on, Brazil, Mexico, Nicaragua, Paraguay and Pakistan initiated similar interventions. Donors and policymakers want to know how much such programmes matter. Does CCT cause girls to delay their age of marriage? Disentangling the causal effects of such cash transfer programmes can help
us to understand the most cost-effective ways of reducing the gender gap and initiating similar programmes in other countries. It is important to evaluate the effects on age at marriage, fertility, child mortality, visits to health centers, women’s labour market participation and other variables.

1.2 Bangladesh
Since three of my essays deal with evidence from Bangladesh, here I give a brief overview of the country. It emerged as an independent country after a nine-month-long liberation war against Pakistan in the year 1971. It is now a lower-middle-income country with per capita GDP of about US $1,100, aspiring to become a poverty-free middle-income country by the year 2021 (World Bank 2012). The total population numbered 152.2 million in the year 2012 (Asian Development Bank (ADB) 2014). The size of the country is 147,610 square kilometers, and more than 75 percent of the population live in rural areas. The country is broadly divided into eight regions for administrative purposes. Figure 1 shows a map of Bangladesh with six divisions (an updated map is not yet available).
Figure 1: Map of Bangladesh

Source:
https://www.google.se/search?q=map+of+bangladesh+with+divisions
The country is progressing, with a GDP growth rate of more than 6 percent on average since the year 2005. The main economic activities are agriculture, industry and services. Bangladesh has made significant progress in reducing the poverty rate, maternal and child mortality, increasing the primary school enrollment rate and other areas (Bangladesh Planning Commission 2013).

1.3 Methodology
The mainstream methodology applied by economists wishing to analyze the partial impact of a policy instrument with the help of historical observed data is econometrics. However, for many policy instruments, we would often like to study the direct, indirect and general equilibrium effects as well. For example, if we want to study the effect of investment finance on HD, then the feedback effect on GDP growth, sectoral output and prices can be studied with the help of computable general equilibrium modelling. In this thesis, I apply both partial and general equilibrium methods for analytical purposes.

1.4 The Essays
This dissertation is comprised of four essays looking at different aspects of growth and development policy instruments, as well as providing a methodology for providing consistent data for spatial economic policy analysis. A short summary of each essay is given below.

Essay 1–Trade-offs in Achieving Human Development Goals for Bangladesh
The achievement of HD goals requires an increase in investment finance. Resources can be mobilized through either domestic or foreign channels to improve HD indicators and to reduce poverty. The most common domestic mobilization strategies are raising taxes and borrowing. Investment finance can also be obtained through foreign borrowing and foreign grants. There is also a trade-off between investment allocated towards improving the public infrastructure (roads and power irrigation) and investment allocated towards non-poverty HDs such as education, health etc., when finances are constrained.

The choice between debt and taxes is basically an issue of distribution across generations. Borrowing raises concerns about the sustainability of growth and may harm growth through terms-of-trade effects. Increased
taxation may hamper saving and investment and lead to lower GDP growth. Broad-based indirect taxes may offset the welfare gains the poor receive from enhanced HD expenditure. On the other hand, the poor might benefit in the long run from the increase in public expenditure.

We apply the Maquette for Millennium Development Goals Studies (MAMS) model, which we have calibrated to the Bangladesh economy. We evaluated alternative policy measures for financing growth and MDG investment in Bangladesh using a counterfactual retrospective comparison of the economic development over 2005-2015. The MAMS framework developed by the World Bank was originally designed to deal with low-income countries in particular.

We find that full achievement of the HD goals would have led to a GDP loss, which would have been significantly larger under the domestic financing scenario than under the tax scenario. The tax-financing alternative is thus the better option for financing large development programmes. Regarding public spending composition, we find that under some circumstances a trade-off arises between overall HD progress and poverty reduction. However, on the margin the impact of reallocating public spending in Bangladesh would be below. This is explained by the significant progress Bangladesh has already achieved, and as such the high unit costs of reaching the most remote parts of the population that remain to be reached.

**Essay 2 – Welfare Impact of Broadening VAT by Exempting Small-Scale Food Markets: The Case of Bangladesh**

Due to equity concerns, many goods, especially food and agricultural products, are typically exempted when VAT is imposed as a consumption tax. Exemptions, though, mean a loss in government revenue and such exclusions also create cascading effects in the economy, mainly because the producers of the exempted commodities do not receive rebates on their input use (Keen 2013). Moreover, exemptions provide an implicit subsidy to high-income groups. There is thus a trade-off between exemptions and the amount of revenue collected and also between equity and the provision of an implicit subsidy.

Hence, we separated food markets into small-scale and large-scale markets by splitting the social accounting matrix (SAM - the database for policy simulations). We assumed that low-income households buy their food in small-scale outlets and high-income households buy from large-scale operators. Then, we simulated a VAT exemption for small-scale outlets based on a high threshold for VAT obligation. We applied the computable
general equilibrium method to calibrate the model for the Bangladesh economy and ran the simulation with the above exemption together with an exemption on agricultural products. Other simulations, such as the imposition of general and uniform VAT, and the paying of a rebate on inputs to remove the cascading effect, were also conducted. The results were compared with the base scenario.

The policy simulations show that a uniform and general VAT on all goods and services is not preferable from an equity perspective. Moreover, for a low-income country with a large informal sector it is difficult to implement VAT. However, VAT broadening by exempting agriculture and the small-scale food market provides better distribution by improving the welfare of low-income groups and deteriorating that of high-income groups. It is also justified in the presence of an informal economy with a threshold for VAT avoidance.


CCT programmes have been applied in many developing countries as an incentive to increase school enrollment, reduce poverty and delay the marriage age under the system of social protection for disadvantaged and vulnerable groups. The FSSP introduced in Bangladesh in 1994 was one of the pioneers of such programmes, one of the objectives being to keep teenage girls in school and deter them from marrying early.

Many studies estimate the causal effects of CCT programmes on schooling outcomes but very few focus on age at marriage. Also, the existing literature suggests there is a need for caution in interpreting the relations involved as causal. This study, by using the FSSP as an exogenous variation in female secondary education, provides new evidence on whether girls’ schooling causes a delay in the age at which they marry. To disentangle the treatment effect, we need to isolate the time trend and the convergence effect from other factors. Hence, we started by applying the ordinary least squares method to determine the trend effect. Then we applied a quasi-experimental fixed effect difference in differences (DiD) approach as in previous studies. Lastly, we applied the regression discontinuity (RD) approach, which is a study design that shares some features with randomized controlled trials (Lee and Lemieux 2010) and can be used to capture the causal effect of a treatment at the local level.

The main contribution of this paper is that we show that the RD design predicts a different causal effect of the FSSP on a girl’s years of completed
schooling and age at first marriage than does the DiD approach. This suggests that the estimation result produced using DiD might be biased as the method does not control for the convergence effect. The RD study indicates that the programme resulted in an increase of approximately 0.4 years of completed schooling for the eligible rural girls. Age at first marriage is estimated to have been increased by at least 0.4 years. The DiD approach gave effects of a 1.1 year increase in completed schooling and a 0.4 year increase in age at first marriage for the rural cohorts fully exposed to the programme.

Essay 4 – Estimation of Multiregional Social Accounting Matrices Using Transport Data
Finding a consistent multiregional SAM is a problem often faced by researchers analyzing the spatial effects of any policy. Policy initiated by one region might have direct or indirect effects on other regions.

We constructed a multiregional SAM by applying the cross-entropy approach, which estimates the coefficients for the new SAM by minimizing the difference between the new and prior coefficients. While estimating the coefficients, some constraints are maintained exactly and some are estimated with errors. Errors in data arise as information on SAM accounts are sometimes collected from different sources, such as input-output tables, national accounting data, transport data etc. Different types of data sources lead to data inconsistencies and errors. These errors are also estimated in this paper and minimized.

1.5 Policy Implications and Future Research
This thesis contributes to the literature by filling the knowledge gap in the area of public spending and financing strategies for growth, HD, equity and welfare, as well as by identifying the true causal effects of CCTs on education and age at marriage, and by developing a methodology that produces consistent data.

In a retrospective analysis of increased investment finance aimed at achieving HD goals for Bangladesh, our simulation results indicate that investment finances obtained by raising domestic tax revenue would be preferable to other sources. In terms of public spending composition, we find that on the margin the impact of reallocating public spending in Bangladesh would be low since the unit costs of reaching the most remote parts of the population are high. A future analysis based on SDGs and using MAMS to achieve the new targets, including trade-offs between
growth, distribution and poverty elimination, might provide new predictions and guidelines as to how the development policy makers should proceed.

In the second essay, a VAT reform analysis revealed that when small-scale food markets are exempted, welfare of the low-income households improve. We mainly focused on households’ welfare and equity aspects. In a future investigation, we would like to obtain survey-based information on where households purchase their food, which would help us to validate our results. We would also like to include a reform in income tax as well so as to understand the impact on overall welfare.

A causal-effect analysis of a girls’ secondary school stipend on education and age at marriage showed positive and significant impacts. Eligible girls on average have more years of completed schooling and also delay their age at first marriage. As a further study, it will be interesting to analyze how much this delay in the first marriage affects child mortality. Parental education determines the child mortality level a great deal, and the level can also vary in different populations due to differences in social factors. As education is endogenous, using the secondary school stipend as an instrument for mother’s education would lead to a causal effect on child mortality.

As two of my essays use computable general equilibrium modelling, further improvements might be made in the regional SAMs estimation by improving data sources. This could help with the construction of a regional SAMS for Bangladesh which would help with the modelling of MDG (or SDG) achievement at a regional level.
References


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