Updated Draft

Macroeconomic Models and Gender

Discussion Paper

by

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Tally Dewan is a graduate student who worked with Informetrica Limited to produce the first draft of this paper. She is now pursuing her studies in Australia.

Beatrix Lee is now "holding the pen" for future versions of this paper, and is working on improving the gender dimensions of the Informetrica models.

Macroeconomic Models and Gender

1 Introduction

As a general rule, most macroeconomic models do not include variables for which gender is one of the properties. Some may contain labour force participation rates by sex and the corresponding source population groupings. But there is not likely to be income variables disaggregated by sex, employment by sex, or differential behavior for any macroeconomic variable based on the mix of male and female incomes, tastes, etc.

As a result such macroeconomic models can say very little about the outcomes for males versus females as a result of various macroeconomic tools (e.g., monetary policy, exchange rate policy, fiscal policy).

Informetrica's recent work on a new model (TIM04) incorporated employment by age and sex as an integral part of the model, using the Labour Force Survey (LFS) industry breakdown as the starting point for the underlying data. For many years, Informetrica's models have had participation rates by age and sex, along with detailed source populations and total populations by age and sex. This now allows for unemployment by age and sex group to be determined in the model, adding a new dimension to impacts and forecasts.

The objective of this report is to further extend the models to provide additional information about different gender groupings, to explore behavioural differences, and to better understand the roles of budget constraints and time constraints on macroeconomic performance.

2 Literature review

Gender is defined not by biological and physiological differences between men and women; rather it is defined by differences in men and women because of social and institutional conventions. Governments need to be conscious of gender in all programs, policies, and budgets in order to reduce gender inequalities and possible program deficiencies.

The budget of a government is the main fiscal policy instrument. It outlines the intended expenditure over a period of time and the method of financing that expenditure. The budget summarizes the fiscal policy tools with which government intervenes in the market firstly, to promote economic growth and secondly, to allocate and redistribute resources in a manner that enhance equitable growth. If budgets are designed in a way that does not address (i) the socially determined roles of women, (ii) women's inability to access or control certain resources and (iii) women's inability to signal in the market on an equal footing as men, then the budget will fail to achieve both of its goals. Yet, often budgets are formulated based on the assumptions that its programs and activities will affect men and women similarly.

Feminist literature suggests that the apparent gender neutrality of budget impact is in fact gender blindness. Research shows that budgets have differential impacts on various groups of men and women and can narrow or widen the existing gender gaps in terms of income, education and health (Bakker and Elson, 1998, p.2). The Australian Women's Budget initiative found that less than 0.1 percent of government expenditure was actually directed towards women and girls. This differential impact of a period's budget can in turn feedback to the next period's fiscal policy decisions. For example, if government expenditure fails to generate employment for women then it would need to continue to provide social assistance and lose out in tax revenues. To address these gender-related issues, gender-budget analysis evolved.

Gender-budget analysis involves assessing the impact of the budget on various groups of men and women (Budlender, Sharp & Allen, 1998). "A Gender Budget outlines not just expected revenue and expenditures, but also responds to the budget impact on women and men, resulting in budgetary commitments that show a solid, accountable connection to a government's gender equality commitments" (Status of Women Canada). Hence, the term "gender budget" does not refer to a separate budget for women, but identifies to what extent the government is in line with its gender equality commitments.

In 1984, Australia pioneered a gender-budget exercise. Federal, State and Territory governments of Australia at various periods comprehensively "gender-audited" their budgets. Following this initiative, Bangladesh, Barbados, Canada, Fiji, India, Philippines, South Africa, Sri Lanka, Thailand, United States, United Kingdom, Vietnam, Zambia and Zimbabwe have undertaken gender-budget analysis at various times (Budlender, Sharp & Allen, 1998; Çağatay, Keklik, and Lang, 2000).

Although there are no specific rules for undertaking a gender-budget analysis, these countries used one of more of the seven tools outlined by Budlender, Sharp & Allen (1998). These tools aim to ensure that gender issues are incorporated at all levels of government policies, programs and that the civil society, private organizations and government are gender-sensitized. These tools are as follows:

1. *Gender-aware policy appraisal*: This requires assessing government policies and their possible gendered effect. This tool is the most widely used and is usually the first step in gender-based analysis of a country.

2. *Gender-disaggregated beneficiary assessment*: This involves surveying the public in order to find their needs, preferences, and satisfaction level with various government programs and policies.

3. *Gender-disaggregated public expenditure incidence analysis*: With the help of household consumption data, the distribution of government expenditure by gender is identified.

4. *Gender-disaggregated tax incidence analysis*: This finds the burden of tax by individuals, identified by gender.

5. *Gender-disaggregated analysis of the impact of the budget on time use*: This explores the relationship between national budget and time used in unpaid work; i.e., the extent to which the budget is dependent on unpaid work.

6. *Gender-aware medium term economic policy framework*: This involves constructing models of national and household income accounts that take account of unpaid reproductive and community work. This also involves working with macro models to assess the impacts of budgets on women (The Commonwealth secretariat).

7. *Gender-aware budget statement*: Each line ministry/department of the government undertakes gender impact of their budgets.

Given the objectives of this paper, the literature review will focus on: (1) experiences with gender-disaggregated public-expenditure review (third and seventh tools); (2) tax incidence analysis (fourth tool) and (3) literature on macro modeling of gender (fifth and sixth tools).

2.1 Experiences on gender-disaggregated government expenditure analysis

Gender disaggregation of government expenditure defines the relative benefits by gender group. The literature on this issue is constantly evolving. However, so far two methods of reviewing the gendered impact of government expenditure are used (Bakker and Elson, 1998). The first method uses gender-aware budget statement, using departmental statements of the effects (seventh tool). The second method uses household expenditure data (third tool) to estimate the incidence of government expenditure by gender group.

2.1.1. First method- Gender-aware budget statement

This method is an annual audit of federal/provincial/local government budgets to find the gendered impact of government programs and activities. The aim of this method is to analyse government's budgetary policies and it's impact on women's status in productive and reproductive sectors. This involves (1) stating the policies of certain sectors, (2) identifying gender issues related to that sector, (3) assessing the extent of government's involvement in that sector and (4) reprioritizing government actions (Bakker, August 1998).

Australia pioneered this way of disaggregating government expenditure. Later on, the Women's Budget initiative of South Africa followed a similar procedure. While the Australian gendered audit is primarily a government initiative, for South Africa it is primarily a civil society exercise. Besides assessing the gender impact of government expenditure, both initiatives also recommend possible reprioritization to improve equality of women (Bakker and Elson, 1998).

Method: This typically involves (Bakker August 1998; Elson, 1998):

(i) Analysis of recurrent government expenditure on government employees to assess the equal opportunity initiatives undertaken by the government. This requires focusing on government expenditure on training, recruitment, promotions, and also the overall compensation structure (Raju, 1999).

(ii) Analysis of targeted transfer programs such as old age security, child benefits, family allowance, maternity and parental benefits, Canada/Pension Plan, etc.

(iii) Analysis of mainstream development programs. These mainstream programs are often gender-blind: the formulation of the budget "ignores the different, socially determined roles, responsibilities and capabilities of men and women" (Budlender, Sharp & Allen, 1998, Comment 2).

In Canada, the Alternative Federal Budget (AFB) primarily focuses on whether government expenditure cuts are necessary and the ways to utilize government surpluses. It comments on the review program process. AFB analyzes and reviews government budgets and identifies which groups of people benefit or lose out from a particular budget. It addresses the gender implication of federal and provincial budgets and recommends ways of restructuring the budgets with special attention to reducing poverty. Gender-based analysis (GBA) is a by-product in AFB's recommendations on poverty, unemployment insurance, job creation, and childcare analysis. For example, the Canadian Centre for Policy Alternatives (2003) evaluates the budget trend for social services in Manitoba; assesses the state of the municipal services, education, and health and investigates the quality and state of those services. A GBA was not undertaken. For federal budget analysis, although there is a section in AFB that deals with gender, it does not undertake any gendered audit of the budget as found in Australia and South Africa. Bakker (August 1998) identifies the need for Canada to undertake gendered expenditure impact analysis of each of the government sectors and ministries.

2.1.2. Second Method: Gender-disaggregated benefit incidence analysis

Government expenditure can have primary effects and transfer effects (Demery, 2000). First, primary effects are the result of direct government expenditure that affects income. This in turn generates more income through the income-expenditure multiplier. This effect is also known as the ‘expenditure incidence’ of public spending. For example, government expenditure will generate more income for women when it spends on those services that employ a high proportion of women.

Second, government spending generates cash or in-kind transfers to the population and improves the well being of the recipients. The in-kind transfers are subsidized government services and this transfer effect is called the ‘benefit incidence’ of public spending. Benefit incidence analysis can capture the gender dimension of public spending, such as health and education. The analysis helps to identify who benefits from the subsidy and how the benefit is distributed among various gender groups (Demery, 2000). Studies on benefit incidence analysis of public expenditure by income class are more prevalent than by gender. However, Ghana (Demery, 2000), Thailand (Vichit-Vadakan and Lorsuewannarat, 2000) and India (Lahiri, Chakraborty, and Bhattacharya, 2001) have undertaken benefit incidence analysis by gender.

Method: Gender disaggregated benefit incidence analysis is a two-step process (Esim, 2000; Demery, 2000). The first step involves calculating the net unit cost of providing a specific government program by dividing total annual cost less user fees by total annual units provided. This information is acquired from government's actual expenditure or allocated expenditure. In the second step, this unit cost of a particular service is then ‘paid’ to households as users of the

service. Households using the subsidized service in effect gain an in-kind transfer. The extent of state-subsidy received by the households depends on the unit subsidy involved and the number of units consumed by the household. The latter information is obtained from household surveys.

The benefit incidence of public spending therefore depends both on the allocation of public expenditures on a particular service and on the behavior of households- utilization of that service by gender. For example, if girls enroll more in primary than tertiary schools, then switching government spending from tertiary to primary schooling will enable girls to gain a greater share of the education subsidy. Benefit incidence analysis therefore reveals and requires two kinds of information. First, the information on data on government subsidy, which is the difference between the unit cost of providing the service less recovered cost. Second, the information on the level of use of government services by gender group.

Note:

(1) Research in many countries focuses only on parts of the budget: particular sectors, ministry or programs because of the unavailability of data on the entire budget and lack of comprehensive household surveys. Health (Ghana), education (Ivory Coast, Thailand) and agriculture are the widely evaluated sectors because they are relatively easy to quantify. Calculation of the unit cost can be difficult for 'overhead type' services that are consumed collectively. Physical infrastructure, trade and industry, communications, national defence, etc. are examples of such services.

(2) Some expenditure is targeted at groups rather than individuals and hence difficult to assign the expenditure to gendered individuals. One way is to allocate expenditure based on individual needs (CASE, July 2000). Elson (2000) suggests that conclusions of whether government spending pattern is beneficial for women must address the needs of men and women first.

(3) Besides unavailability of data, problems related to defining the unit of analysis add to the complication of performing incidence analysis.

(**4)** Benefit incidence analysis is a static model and does not take account of macroeconomic, institutional and social factors (Esim, 2000).

(**5)** The method suggests that the incidence of a particular government service depends not only on how much of that service is actually provided by the government but also on the ability of the users, particularly of women, to access that service. For example, if government decreases the unit cost of secondary education, parents may send their daughters to high schools. However, if the social norms were such that the girls are not encouraged to attend high schools then regardless of the amount spent by the government, female's utilizations of government's educational expenditure would be low. The findings of this method hence would only be able to show the distribution of use of public expenditure but not the causes of it.

2.2 (6) **This method also addresses the need of budgetary institutions to have adequate funding for gender mainstreaming initiatives. The government gender machineries such as the Status of Women in Canada, needs enough control of funds compared to other ministries and the Gender**

Focal Points of each ministry needs to have a role in ensuring an adequate share of the allocated budget for the concerned ministry. Without adequate allocation of funds to these budgetary institutions, the gender issues cannot be mainstreamed and gender balance of public expenditure cannot be ensured (Elson, 1998).Experiences on gender-disaggregated government taxation

In the early stages of gender-budget analysis Budlender, Sharp & Allen (1998) recommended incidence analysis of taxation. However, over the years, it has been widely recognized that all the revenue sources of the government should be gender analysed, rather than just taxation. Government revenue analysis is important because its planned expenditure and priorities depend on the revenue projections (CASE, 2000). Revenue analysis is however, more country specific than expenditure analysis. This is because in all countries, the government expenditures are largely devoted to social expenditures such as education and health. However, the sources of revenues vary between developed and developing countries (CASE, 2000). In developed countries such as Canada, the major sources of revenue are income and corporate tax. This paper only reviews the literature on tax incidence. Discussion on tax reform and other issues are beyond the scope of this paper.

A *gender disaggregated tax incidence analysis* reveals the burden of various taxes. It shows the proportional net tax paid by women compared to men. Direct taxes include personal income taxes, pension and retirement funds contribution (both private and public), unemployment insurance premium, company and capital transfer taxes, other deductions and allowances (Esim, 2000). Goods and services tax, transfer duties, etc. fall under indirect taxes. Indirect tax incidence analysis requires information not only on wages and salaries of households, and capital income; but also on expenditures by commodities (Esim, 2000). Men should pay larger direct tax since they are employed in full-time work more than women and they work for longer hours. The burden of indirect tax is unknown as there is no study on gender disaggregated tax incidence for the Canadian economy. No country has undertaken gender disaggregated tax-incidence analysis, especially for indirect tax. However, gender-wise impact analysis of tax policy is undertaken in South Africa, Australia and United Kingdom (Budlender, Sharp & Allen, 1998).

Besides direct and indirect tax, another form of tax often noted in the feminist literature is the ***reproduction labour tax*** (Bakker, 1998, p. 9; Smith, n.d.). This is the implicit tax that women pay due to their socially determined role in unpaid reproductive work. This affects women's decision to participate in the labour force and the duration of work in the paid labour market. In Canada, 23% of women aged 25-44 work part-time because of personal and family responsibilities (Status of Women in Canada, 1995). Government's restructuring and adjustment policies can affect this labour tax on women since cuts in public social expenditure increase it and lead to a further distortion of government's resource allocation (Bakker, 1998, p.9).

Federal and provincial governments collect regular forms of taxes i.e., income tax, sales tax, etc. They then use these taxes in social assistance programs and infrastructure development in order to improve the living standards of the population. Reproductive labour taxes, largely paid by women, are an implicit tax. However, the government is not compensating women for their contribution in improving the household sector and their vital role to the functioning of the economy and the society.

Note: The following issues should be considered in undertaking tax-incidence analysis.

1) Whether tax returns are claimed jointly by the married couple or individually (Raju, 1999). Evidence from Canada, US and Japan reveal that a joint filing system discriminates against secondary earners (women) of the household since these secondary earners are taxed at the highest marginal tax rate of the primary income earner (Esim, 2000).

2) Whether all non-labour income (interest incomes, dividends, etc.) earned by a married couple is assigned to the husband.

3) Whether married men are considered as primary income earners and entitled to larger tax-free allowance/special credit than married women as they are regarded as secondary income earners or dependents.

4) Type of tax rebates available to men and women. Tax concessions for contributory-employment related pensions would benefit men more than women since the sectors that provide this kind of concessions are dominated by men (Budlender, Sharp & Allen, 1998).

5) Are data on household budget management available, so that gender differences in pooling resources and its implication on tax incidence can be taken into account (Esim, 2000)?

2.3 Literature on macro modeling of gender

The main thrust of literature on engendering macro models is centred on recognizing women's contribution in the unpaid household and community work. This stresses the importance of taking account of the unpaid sector and its contribution to the economy. Gender analysis is incomplete if we only assess outcomes of policies and programs by gender. To get a clearer view of the gender relations, and how policies would affect gender dimensions, gender must be incorporated into the macroeconomic framework (Walter, 1995, p. 1869; others cited). To incorporate the gender dimension in the model, mere classification of the variables by sex is not enough. Rather we need to define the groups that are faced with certain constraints in the macro model (Walter, 1995, p. 1870).

Engendering macro models involves recognizing that besides public sector and private sector, the unpaid sector also contributes to the national income and output. "Estimates in developed countries suggest that, if unpaid work was included, GDP would be at least one and a half times as large as currently measured" (Budlender, Sharp & Allen, 1998, Section 6). Per capita GDP measures the well being of the population. Ignoring household subsistence production fails to take account of the total and actual well being of the country. A study by Soupourmas and Ironmonger (2002) with Australia's time-use budget information finds that the Australian household economy is 80% of the size of the market economy and economic value added by the unpaid labour and the households' own capital was worth $471 billion.

Macro modeling will allow mainstreaming of unpaid work. It does not mean that all unpaid work needs to be converted into paid work equivalence, but it will create an environment where policy

makers and individuals can identify whether men and women have equal sharing of paid and unpaid work and whether current policies adversely affect their opportunities to participate in the labour market and access resources (Hirway, n.d.).

The literature on macro modeling of gender divides the macro economy into two sectors (1) paid work and (2) unpaid work. Work is defined as the labour input into production. When labour is paid with compensation equivalent to the labour input, it's called paid work (UNESCAP, n.d.). Works generally linked to the market, i.e., in the private, government and even in the household enterprises are considered paid work. The unpaid sector includes household production and volunteer or community work. Unpaid work is often referred to as unproductive or the care sector. The unpaid sector includes production of domestic or personal services by members of the households for their own final consumption (UNESCAP, n.d.). Cleaning, decorating and maintenance of dwelling; repair of household durables; preparation and serving of meals; taking care of children, sick and elderly, etc. are all part of unpaid work and usually are excluded from the System of National Accounts. In some cases, it is recognized that there is also a reproductive sector, engaged in bringing children into the world and sustaining them until adulthood (or beyond).

Women spend a significant portion of their daily hours in unpaid work. Whether women are working full-time or part-time, compared to men they spend on average 15.2 hours in unpaid work, which is twice the amount of hours spent by men (Statistics Canada, n.d.). Women in Canada also undertake 65.6% of all household work (Status of Women Canada, n.d.). There is a social male bias against working in the unpaid sector. Women's involvement in the unpaid sector arises because of (1) social convention; (2) women's inability to participate on an equal ground in the labour market due to social, cultural and institutional reasons and (3) women often act as a buffer during family or economic structural adjustment by reducing their work in the paid sector. These attributes imply that there is a linkage between the paid and unpaid sector. Any policies directed at affecting the paid sector also affect the unpaid sector that, in turn, feedback on the paid sector.

This linkage between paid and unpaid work means that an excess budget deficit that generates hyperinflation or high budget surpluses that generates deflation can destabilize the economy by overburdening the families and communities. These policy stances will create widespread unemployment, massive reduction in public service and an increase in poverty. This is because the reduced government expenditure leads to greater reliance on women’s unpaid work to offset the reduced public services. When male unemployment increases, women's participation in the labour force may increase, but without any proportionately decrease in hours or load of unpaid work. Therefore, the total burden of female work increases due to these fiscal policy stances.

It is important to recognize this burden on the unpaid sector because (1) it is unfair to women, and (2) the efficiency and effectiveness of government policies are reduced when this contribution is ignored. If macro models do not account for the time women devote to unpaid work, then human resources of women and girls will be depleted by overwork, which again will feedback by reducing the productivity in the market economy (Elson, 1995). Moreover, fiscal and monetary restructuring may increase the productivity in the paid sector but may hide the decreased productivity in the unpaid sector due to the restructuring. For example, early release of

patients from the hospital may show a productivity increase in treating the patients, but this means women's need to put in extra hours of post-hospital care (Çağatay, 1998).

Generally, macroeconomic models view women only as consumers of public and private goods. However, women are producers as well as consumers. In the household, women contribute to the maintenance and building of the labour force, and in the community, women contribute to building of social capital. The macro models fail to take account of women's contribution to maintaining the social framework, and, therefore, ignore the role of social structure in destabilizing the governments' budgetary stance.

Moreover, the general macroeconomic models only take account of sectored approach when they consider growth of the aggregate economy. As a result, literature on macro-economic policy impact largely focuses on aggregate variables such as on employment, inflation, budget surplus/deficit, etc. (Bakker, 1994, p. 8). Gender disaggregated impact on these variables is rarely evaluated. Studies by individuals and institutions are yet to engender the macroeconomic framework.

Papers by Elson (1995) and Walters (1995) are briefly outlined in this report. Neither paper formally develops a model with gender. Rather they suggest ways of incorporating gender in the macro models. While Elson's arguments are directed towards Structural Adjustment Program (SAP) models for developing countries, recommendations can be useful in the developed country context as well. The recommendations provided by these two papers have a common thread, which is the necessity of taking account of unpaid reproductive sector and its link with aggregate output.

Note: Although neoclassical theory puts a time budget constraint between paid work and leisure, the macro literature on gender fails to take account of leisure and recreational time spent by men and women. This is important in macro modeling of gender effects because the two-sector model (paid and unpaid work) will only reflect the switch of time between these two sectors from a policy shock but will not reflect how it will affect leisure time. Therefore, the literature on macro modeling of gender assumes that women and men have insignificant amounts of leisure time.

2.3.1. Elson (1995) recommends ways of engendering macro models in the context of developing countries. For the past two to three decades, most developing countries have been subject to Structural Adjustment Programs (SAP) implemented by the World Bank. SAP aims to decrease current account imbalances and budget deficits by initiating structural reforms and by cutting social expenditures. The idea is that these reforms will make the way for higher economic growth in the developing countries.

The underlying models that drive SAP are (i) a one-good Revised minimum standard (RMS)model based on the Harrod-Domar model and (ii) a two-good Swan-Salter model (Elson, 1995). The RMS model helps to identify the amount of aid required for the structural adjustment without negatively affecting growth. And the Swan-Salter model helps to identify the required restructuring of expenditure and production. Elson (1995) in this article suggests ways of incorporating gender in these two models.

(i) First, Elson (1995) addresses the adjustment mechanism in the RMS model. The adjustment mechanism takes place to restore macro aggregation gaps such as saving and investment (both government and private sector). Adjustments in the composition of consumption expenditure, household decision making, income distribution, etc. all come into play in incorporating gender during this adjustment process. For example, when saving is lower than investment, to induce greater saving the SAP induces policies to change consumption structure away from market goods. This puts a burden on the unpaid sector where women invest their time and effort in producing non-market goods. It must be noted that Ertuk and Çağatay (1995) find that the reproductive labour pattern in turn can have an effect on aggregate investment and saving.

Canadian evidence supports Elson's (1995) argument. The Elliot Lake Tracking (cited in Bakker, August 1998) case study of Canadian households finds that during the economic adjustment such as reduced income after lay-offs led to restructuring of household consumption, and increased reliance on non-marketed outputs such as vegetable gardening and preparation of meals from scratch.

Elson (1995) also points out the following issue regarding gender in the RMS macro models. (a) The RMS model calculates investment productivity without taking account of non-monetized (reproductive sector) costs. This cost arises because to increase productivity in the monetized sector the SAP policies transfer the burden to the reproductive sector. As a result, the apparent increased productivity in the monetized sector is just a switch of increased unproductiveness in the unpaid sector.

(b) Aggregate output could be increased if efficiency losses due to male bias in decision-making were reduced. In the labour and product markets, barriers to access for credit, land, resources and services could be reduced. Modeling of gender in the macro level therefore, stresses the importance of the constraints that social conventions put in the growth of the paid sector.

(c) More equal income distribution may help long-term development. This is because women tend to invest in health, nutrition and education, whereas men tend to spend on items of personal consumption. Gender difference in expenditure pattern therefore can affect growth in the long-term.

(ii) Elson (1995) then recommends ways of improving gender dimensions in the two-good small dependent economy model of structural adjustment suggested by Collier (cited in Elson, 1995, p.1860). The model is based on the premise that there is an excess global demand for tradable goods. SAP would increase the price of tradable goods in the developing countries, which in turn will reduce consumption of tradable goods by domestic consumers in the developing countries. As a result, SAP emphasizes adjustment of resources between traded and non-traded goods. Women's inability to access land, weak entitlements to resources and inputs, and lack of decision making power are a constraint during the adjustment period to shifting resources from non-tradable sector to tradable sectors. Therefore, the constraints faced both within and outside household negatively affects output adjustment (Çağatay, 1998).

2.3.2. Walter (1995) reviews neoclassical, Keynesian and endogenous growth theories. He identifies that these theories fail to address gender related constraints faced by the labour force in the paid and unpaid sector. He recommends ways of engendering these theories. The most

significant recommendation is that the macro model needs to address labour as a produced means of production; i.e., poor nutrition and health, low quality education, poverty, stress, etc. can reduce the stock of labour and effective labour services, which in turn will affect economic growth (Walter, 1995, p. 1878-79). Manchester University is undertaking research in building such a model.

Walter (1995) defines the unpaid sector as the location for physical and social activities to reproduce and maintain the labour force. Walter suggests inclusion of variables that are of gender significance, for example, reproduction sector. Such a variable can be the proportion of population that can effectively participate in the paid sector. To set the relationship between the paid and unpaid sectors Walter suggests that the unpaid sector should be treated as relatively autonomous. This allows the unpaid sector to influence the structure of the paid sector and determines the quantity and quality of the labour available in the paid sector. This way gender links are introduced in the macro model.

(a) Both Neoclassical and Keynesian theories assume an identity relationship between population and labour input and treat increases in population as exogenous. Hence, it assumes labour force input is proportional to population. The theories do not take account of the interaction of population and labour force with respect to migration, social services, gender relations, linkage between paid and unpaid work, etc.

(b) Keynesian growth models: Labour issues are addressed only by whether aggregate expenditure/consumption is enough to absorb the available workers. Also, aggregate expenditure is only a function of the distribution of income between the workers and capitalists. Although, distribution of income within the family and the control of resources may affect the composition of the aggregate spending and income patterns (Walter, 1995, p. 1873), this link is usually not included.

(c) The capitalists and workers are incorporated as groups whose saving and investment behavior is dependent on institutional settings but independent of individual preferences and endowments. Similar arguments can be applied for the family institution in influencing labour force input.

Summary of gender-aware macro modeling:

a) Gender inequalities in the household level; unequal decision making power; unequal access to resources; legal, institutional and social constraints in the labour and product market; all can have negative effect on the macroeconomy and can inhibit full growth of the paid sector.

b) The contribution in the unpaid sector adds to the national output and building human capital. The cost of maintaining the labour force is not accounted for (Çağatay, 1998).

c) The linkage between the paid and unpaid sector reflects that the unpaid sector acts as a buffer. Increased efficiency in the paid sector hides the inefficiency in the unpaid sector.

d) Expenditure and saving patterns of women help promote growth. Women have a higher marginal propensity to save.

e) There are contra-cyclical patterns in women's employment (Rubery, 1988). During adjustment periods and downturns of the economy, women work harder and longer in both the paid and unpaid sectors due to reduced income from loss of work by the primary income earner and/or reduced real income.

Methodology: The objective of the national statistical accounts is to provide information regarding the status of the country, to assess the well being of the people and to stimulate policy debates about improving people's lives (Hirway, n.d.). Since, the System of National Accounts does not take account of unpaid work, our aggregate national income and aggregate time spent for our well-being is under-reported. As a result, the present national statistical system only partially reflects how policies affect our lives.

Therefore, the System of National Accounts should include the contributions made by the reproductive roles of women less any support provided by the government for those services. It should also include the community roles, and especially the unpaid work that women provide in the family businesses (Budlender, Sharp & Allen, 1998). After classifying all the household activities, one approach is to value them by (i) opportunity cost i.e., forgone wage rate for that activity or (ii) replacement cost i.e., wage of market worker for that specific activity.

In 1993, the revision of the International System of National Accounts explicitly recognized the need for a system of Satellite accounts that will measure and value unpaid work. Canada has estimates of the monetary value of unpaid work since 1978, time use surveys since 1986 (every 5 years, 10,000 households) and questions on unpaid work in the national census since 1996[1]. The value of unpaid work is calculated with the Total Work Accounts System (TWAS) that measures time spent in both paid and unpaid work (Commonwealth Secretariat, n.d.). These Satellite accounts value household work in a manner that is comparable with GDP. We may use this value as given or re-estimate the value of unpaid work. We may use this valuation in the first stage, and later we may value the unpaid work in a similar manner as Ironmonger (1994).

The experience in developing countries shows that the *Social Accounting Matrix* (SAM) is widely used by researchers in undertaking impact analysis of particular policies. Standard SAMs do not include gender-disaggregated information. Recently, several studies are incorporating gender in SAM. Fontana and Wobst (2001) constructs a SAM for the year 1993-94 for Bangladesh by gender. They use average weekly hours that households spend both in paid and unpaid work. They also incorporate more than one activity performed by a household to capture underemployment.

3 Canadian Experience

Coinciding with the Fourth United Nations World Conference on Women held in Beijing, China, the Government of Canada committed towards closing the gender gaps by announcing the Federal Plan for Gender Equality (Status of Women Canada, 1995). Since then, Canada

[1] See Statistics Canada documents for gender disaggregated contribution in unpaid work and its valuation.
Statistics Canada. (n.d.). *As time goes by- Time use of Canadians*', 89-544-XPE
Statistics Canada. (n.d.), *The Statistics Canada total work accounts system*. 89-549-XPE
Statistics Canada. (n.d.). *Households' unpaid work: Measurement and valuation*",

developed tools and steps to formulate gender-aware policy and analysis (Women's Bureau, 1997a). Gender-based analysis (GBA) is a tool to systematically integrate gender considerations into the policy, planning and decision-making processes (Status of Women Canada). Also indicators reflecting gender status have been developed (Status of Women in Canada, 1997; McCracken, and Scott, 1998).

Various government ministries/departments such as Health Canada (2000), Canadian International Development Agency (CIDA, 1999), Department of Justice, Human Resources Development Canada, implemented gender policies. Besides the federal government, some provincial[2] and territorial governments also incorporated gender-based tools in their policy and budget analysis. British Columbia and Newfoundland & Labrador made great strides towards policies and programs to increase gender equality. However, studies on gender appraisal of Canadian Government's policies and budgets are limited. With focus group discussion, Masuda (1998) identifies certain programs in the government budget that affect women, but does not analyse the entire budget.

4.1 Canadian women's status in the labour market: Jackson (2003) provides a detailed description of the labour market status of Canadian women relative to men and the change in this status over the 1990s. Here, briefly an overview of some important facts from Jackson (2003):

-Although the gap in the employment rate between male and female is now at an all-time low, women are largely employed in part-time, casual, self-employment, temporary, voluntary and 'pink-collar' jobs.

-For the same university qualifications, women are paid significantly less than men (70% of men's). The earnings and wage gap grew slightly between 1997 and 2000.

-Wages of unionized women are greater than non-unionized women. And, unions raise wages more for women than men. Women workers of colour are less likely to be unionized.

-Women are concentrated in sectors that provide an hourly wage of less than $16, whereas men are concentrated in sectors that provide a wage of more than $16 per hour.

-Immigrants, aboriginals and women of colour are paid significantly less than white Canadians. They are also more likely to be unemployed at least once in a year.

-In the past few years there has been a large increase in the employment rate of older women (55+).

-Most women with children are in the workforce, usually working full-time.

-Women are less likely to receive employment insurance benefits than men if they are unemployed. Also, women's involvement in non-standardized work means that they contribute less than men to pension plans.

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[2] Some references are
New Brunswick Advisory Council on the Status of Women. (1995). *Equity analysis guide: A tool for analysis of the impact of initiatives on gender equality*. Moncton. December.
Nova Scotia Advisory Council on the Status of Women. (1996). *Gender analysis in the Nova Scotia government.* Halifax. December.
Ministry of Women's Equality. (1997). *Gender lens for program evaluation: A guide to gender inclusive policy and program development.* Province of British Columbia.

-Women contribute less than men to CPP and RRSPs, yet women's life expectancy is greater than men by six years. Few women are covered by private or employer-sponsored pensions, as many are part-time workers. Retirement income programs should take account of this (Women's Bureau, 1997b).

-Compared to men (14%), more women are employed (25%) in the public sector.

4 Planned Extensions

We plan to make the following extensions of the existing macro model.

(1) Income concepts: We will at first refine the income concepts so that estimates of income by age and sex can be made, consistent with the total disposable income.

(2) Household production: We will include outputs of household production. For this we will consider the household as an unpaid sector that produces final outputs to the economy. These outputs use intermediate goods purchased in the market, and at present considered as final goods.

(3) Time use allocation: We will broaden the categories of time use so that it better informs us about the burden of household and related unpaid work on women. Leisure time will be identified.

(4) Government services to people: We will use a functional breakdown by age and sex where appropriate to identify benefit incidence analysis of government expenditure.

(5) Engagement in society and labour force activities: This will capture both the employment and unemployment aspects of the total labour force and help us put a net value depending on the time use.

5 Income Concepts

5.1 Personal Disposable Income

The objective is to add a disaggregation of disposable personal income by gender and by age that exhausts total disposable income.

(i) Earned Incomes: wages and salaries; income from self-employment

(ii) Rents, interest and dividend incomes

(iii) Transfers received include:

(1) Social insurance (government sources): Employment insurance benefits,

(2) Social security benefit (private sources),

(3) Social assistance benefits: Elderly benefits, Child benefits, NPISH, relief for heating expenses from the government and,

(4) Family support (e.g. child assistance, cash or non-cash gifts).

(iv) Gross cash income: Summation of (i), (ii) and (iii)

(v) Transfers paid: (1) Social insurance to the government or private employer; (2) family support

(vi) Taxes on income and wealth

(vii) Disposable income: (iv) minus (v) and (vi)

5.2 Government expenditures on goods and services

Provision of education, medical services, human resources development expenditure, veterans affairs, expenditure on government broadcast, industry, and other social services to people represent a form of income-in-kind and should be an augmentation to personal income.

This component of income can be calculated by a unit cost method of government expenditure. This requires acquiring information regarding access of these services by individuals (by sex and age). For example, for education services we have information on enrolment rates of individuals in different levels of education. Government expenditure on these various levels of education will then allow calculating unit cost of government providing this service. This unit cost then can define an in-kind income. Data at the disaggregated level of primary, secondary and tertiary level of education expenditure by age and sex can be defined.

The problem with this method is that it only takes account of people that are able to access the government provided services and hence is unable to reflect issues such as women's ability to access those services. Therefore, this method cannot incorporate social and institutional barriers that particular groups of people face in accessing these services. This will be particularly evident for certain rural areas where access to health and education can be low; and for women from certain ethnic backgrounds that discouraged from attending higher levels of education or access certain health services.

For some services if information on the actual access level by individuals is unavailable, we can use individuals desire or need for that service and can approximate the government expenditure accordingly. This information can be gathered from household surveys.

However, the problem with the above methods is that we can approximate government expenditure by male and female in aggregate, but it can be difficult to assign unit cost to individuals. That is, once we calculate the unit cost, to whom do we assign this in-kind income? Suppose, we calculated unit cost for tertiary education by age and sex, now, do we assign this as income to all those that are currently attending the universities? In the case of scholarships, they are counted as transfers from government to other groups that augments total transfers.

For some social services offered by government that are of an overhead nature targeted towards households rather than individuals, then the challenge is how to allocate it over individuals. Some parts of government expenditure may not be allocated by age-sex group (e.g., defence, Administration, human resources development, foreign affairs and international trade). In such a case a simple allocation by population (same amount per capita) should be defensible.

Since, social insurance and social assistance are defined in Section 2, we should not incorporate it in this part.

In-kind transfers from the federal government are small compared to provincial and local governments. Provincial government provides healthcare and universities/colleges, and the local government provides in-kind transfers for old age and elementary and secondary schools.

5.3 Outputs of Household Production

The general approach is to have the household performing a series of activities as a business. Sales are based on the volume of services provided and/or the number of goods produced (clothing sewed, meal prepared, etc.), valued at market prices. Here, healthcare (health production literature), child quality, etc. are regarded as produced commodities. The outputs of household production are as follows.

5.3.1 ***Health services at home:*** Assisting sick household members.

5.3.2 ***Preparation and Delivery of Meals:*** Grocery shopping; preparation of meals; after meal cleaning and washing of the dishes; preparation of the next day lunches for the household members.

5.3.3 ***Provision of Accommodation:*** This includes making arrangements such as cleaning and house-keeping so that the output is living area allowing people to sleep, eat, relax and socialise.

5.3.4 ***Provision of Clean Clothes:*** Washing, ironing and repairing of clothes.

5.3.5 ***Childcare and education services:*** Taking care of children at home, assisting them with schoolwork.

5.3.6 ***Transportation services***: Taking children to schools and school activities; taking sick and elderly to the doctors are included in this category. However, transportation is an intermediate input to the production of some of the basic household outputs. Therefore, the System of National Accounts needs to only calculate the output value of the basic five outputs and not double count the value of transportation services used as an intermediate input as another output. Indeed, by defining the basic activities more broadly it may be possible to eliminate transportation services as a separate service of the household.

Both unpaid labour and paid labour, market capital and household capital can be used to produce these outputs. However, (1) household outputs that use paid labour, e.g., paid house cleaners, and (2) household outputs that use market capital, e.g., rented apartment are included in the System of National Accounts. The task is to account for the household productions that are not included

in the SNA. That is, we need to calculate the value of household outputs that use purchased intermediate inputs and employ their own capital and labour inputs.

The basic five household outputs use inputs: time and effort in cleaning, washing, transportation, shopping, food and clothes storage, repairs and maintenance, gardening, pet and pool care, bill payment and other activities related to household finance.

We can value the goods/services produced by the cost of acquiring that particular service in the market or by opportunity cost (i.e., after-tax wage rate). The net effect of this approach is to recast the household from an inefficient producer of any single service (e.g., food preparation or child care) into an efficient multi-service provider of many services.

The effect is to lower market consumption of households and raise their total consumption. The net income from household production (sales less purchased inputs and CCA) increases disposable income of the household.

5.4 Treatment of Consumer Durables

Besides taking account of disposable income and the government in-kind services, the monetized income encompasses household capital and durable goods (Lazear and Michael, 1988). These include long-lasting items such as a home, automobile, etc. These durable purchases would be treated like a capital good, purchased by the household producer (investment) and providing a service represented by the CCA component of value-added.

5.5 Time Use Budgets

Much of the economic literature includes a provision of a budget constraint, either for an individual or a firm, or even for governments more recently. Rarely is there recognition of the **time constraint** for people to work, to consume, or to otherwise be engaged in society. Household time use budgets also reflect the knowledge, skills, efficiency, and economies of scale of the household in producing certain household outputs.

We will use an annual time budget in the annual model, although it is possible to include a "daily" or "lifecycle" version as well.

The time categories to be tracked include:

1. Personal time: This includes personal care activities such as sleeping, eating, personal hygiene.

2. Paid employment: This involves work for 8 hours per day and associated paid overtime work.

3. "Shadow" work: The time spent on "shadow work" is calculated by subtracting time spent on paid work from total time spent on work and work-related activities. "Shadow work" therefore includes transportation time to and from work, preparation and getting ready for work that is not compensated by work, undertaking part of work responsibilities

at home, training and education for work but unpaid, and working overtime without compensation.

4. Household production: This is the time devoted for production of household outputs discussed in the previous section. However, I think efforts and time spent for family recreation could be included in this category as a separate output. But the personal recreation will be the residual time left, which I included in the eighth category of time-use.

5. Reproduction time: Reproduction time is related but separate from household work. Reproduction time includes pre-natal care, childbirth, feeding, caring, bonding and guidance with children up to four years old. From the pre-natal period until children are above four years old, significant time and effort needs to be put in addition to the household production time mentioned above. Reproduction time would also include ongoing guidance and caring which families without children will not incur.

6. Education: Time spent at the university, college and school as a student are included in this category.

7. Time devoted for community and voluntary work.

8. Residual Time (e.g., leisure, etc.): Now there should be a difference between personal recreational activities and family recreational activities. This includes gardening, sporting, pursuing hobbies, entertainment, smoking, drinking, etc.

We need to be careful not to double count each activity when we are calculating income. From the above time categories, time spent on paid employment is taken into account in section 3.1. Household production time is included in calculating income from household production in section 3.2.

Note that there is a difference between shadow work and transportation services. Time to commute is not compensated, but it is necessary to move to/from work. Therefore, it is not considered as double counting.

For education time, individuals are provided with in-kind income, which is also calculated in the government expenditures on goods and services. We are considering the student's time, not the teacher's time that is compensated by paid employment.

Personal time includes individuals' time spent for maintaining their own health and well being such as taking showers, eating, etc. These do not require any income value assigned to them.

Can we define voluntary and community work separately from the household work? This is because if we are going to attach an income value for the time spent on this work then it should be added to the total income budgets. Value may show up as a transfer to the Non-government-organizations as a gift.

Time-use budgets undertaken by the official government agencies may not capture the time use pattern by illegal immigrants (Waring, 1996). Although this may not be a big issue in the context

of the Canadian economy, it can be in terms of other countries such as Thailand, parts of Europe, etc. In addition, time use budgets should include a large sample of First Nations and recent immigrants. Unpaid work outside the household can be greater for these two groups than other Canadian population groups.

5.6 Total Income Budgets

The total net income of the person (and the household) can be defined as the sum of personal disposable income, public goods received, net income from household production, the increase in the value of consumer durables, and "leisure time" excluding "shadow work". Transfers from one person to others in the same household or different households should also be recognized separately, allowing for a clearer idea of income of persons and households as well as of voluntary support systems. I have included transfers between intra and inter households in the disposable income group in Section 3.1.

6 Data Issues

6.1 Known problems

Disaggregation by age and sex may be insufficient in some cases. People are embodied in family structures, and different family structures may lead to different behaviours and different resources. It is not only by family type, but also would vary by race, ethnicity, and disability and by province.

Government expenditure does not provide a functional breakdown in Canada at present. Disaggregated expenditure information by each program would increase the precision of assigning income to individuals.

7 Areas for Possible Improvement

Can we develop better consumption equations tied to the amount of time spent on household production? Can consumption be disaggregated by person, allowing for saving by person? We would expect women to have a higher propensity to save than men. It would be interesting to see this by different age group also. Although household expenditure surveys do not gather information on individual expenditure patterns, one method of dealing with it would be to look at differences in expenditure patterns by households headed by men and women. We would a priori expect that households headed by women would spend a larger portion on children than households headed by males.

How are time budgets reallocated? This can reflect the institutional structure of the family and the society towards women's role in the labour market. A policy shock may reflect that while women's time budget has shifted from leisure both to the labour market and to household production, for men it may show little change.

Can we link certain expenditure of the household with men's and women's time budget? Women tend to spend on expenditures that are of investment in nature, for example, health, education etc. But since, we cannot find expenditure data on an individual basis, probably we can try to link

between women's time and certain household expenditures. For example, vacuum cleaners would reduce women's time spent in cleaning the house. Refrigerators allow women to prepare and store meals for couple of days, which provides economies of scale. Without a fridge women would have to shop and cook every day. It is true that these kinds of expenditures are for household consumption, but it does reduce the burden of household chores.

Can we better account for intra-household income and saving distribution so that consumption expenditure and labour force supply decisions of the household can be linked with the governments social assistance programs? Literature often only focuses on income distribution among households rather than income distribution within the household. This ignores that the income, expenditure and saving distribution pattern of household can depend on household characteristics such as age, sex, race, education of the head of the household, location of residence, custodial relation with the children, etc.

Household expenditure survey data on clothing expenditure by age and sex are readily available. Clothing expenditure can be a starting point for analysing household expenditure by gender, and by adult and children. Expenditure distribution among household income earners on other items requires some assumptions. Spending on utilities can be viewed as an intermediate input to the basic household services. In dealing with household expenditure distribution, we need to take account of (i) the life-cycle pattern of expenditure, (ii) household expenditure that substitutes away from the adult to the children. For example, expenditure on childcare products increases with an addition of a child and this will alter the expenditure pattern of the adults. Moreover, as the child grows up, expenditure on education rises and all these needs of the child will lower the spending of adults for themselves. These exercises can also reflect the income elasticity of various expenditures by age and gender.

In addition, we can take advantage of using the Survey of Household Spending to break down consumer expenditure components into intermediary goods and capital inputs to households production. Then , we can create a household input-output table for the economy.

8 Impacts and Forecasts

General policies like higher interest rates, exchange rate changes, and tax hikes will be simulated.

Policies with expected gender effects will also be examined with and without the gender perspective component. For example, does provision of childcare show up differently in the two models?

As a by-product of adding the component, there will be a set of forecasts each time a scenario is produced. This can be used to help gain an understanding of possible future paths, given unchanged distributions or policies.

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