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Gender and Informal Sector Analysis in India

Economy Wide Approaches

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Abstract

The main purpose of this paper is to look at the incorporation of gender and the informal sector within a general equilibrium framework for India. Moreover, we clarify some important links between a gender aware informal sector based social accounting matrix (SAM) and general equilibrium models such as the computable general equilibrium (CGE) models including as a special case the fixed price multiplier (FPM) models. In particular, economy wide modelling of gender and the informal sector is facilitated by the use of national level data and constructing the base data set as an SAM. Another important strategy is to conceptualize the economy within gender structures, entailing the recognition of gender relations as an intervening variable in all economic activities.

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1 Introduction

The main purpose of this paper is to clarify some important links between the social accounting matrix (SAM), gender, the informal sector and fixed price multiplier (FPM) models and use of these for policy analysis. In particular, we examine how economy wide modelling of gender and the informal sector in the economy could facilitate understanding the role these important aspects in driving the growth trajectory in a developing country like India. We feel that there are similarities with the other countries (China, India, Brazil, and South Africa – CIBS) in this UNU-WIDER research programme, in the role of the informal sector as well as a large share of women workers that without policies addressing them explicitly could lead to unintentional developments that may hamper a desirable growth with equity, an agenda of the current UPA government in India as well as the Millennium Development Goals (MDGs).

Although both the informal sector and gender-related development issues have prompted serious debate, the absence first of the necessary data and then the appropriate gender and informal sector related macroeconomic analytical tools have penalized quantitative analyses. More generally, it must be recognized that there are few instruments, which can relate macroeconomic policy and microeconomic behaviours. In this context, the structuralist macroeconomic frameworks such as the SAM, FPM, and the computable general equilibrium model (CGEM) are tools that can address these concerns. More importantly, developing these frameworks drive the extraction of relevant data from various economy wide data sources and force a consistent framework satisfying the national accounting equalities for an economy. Such models have been applied to a range of policy questions in a number of economic fields over the last few years. They include public finance and taxation issues, international trade policy questions, and evaluations of alternative development strategies and the implications of macroeconomic policies on distribution of resources.

The base date set for developing either a FPM or a CGE model is generally an SAM. The roots of SAM go back to the pioneering work in social accounting by Gregory King in 1681. However, modern social accounting is largely inspired by the work of Stone in connection with the Cambridge growth model in the 1950s and 1960s. Stone's work with the UN SNA project gave further impetus to developing a disaggregated household sector description. In the 1970s Pyatt, Round, and Thorbecke advanced the work to apply the idea of a SAM to developing countries. The work done in the 1980s at Cornell by Thorbecke, Khan, and others led to disaggregation of technologies and the inclusion of the informal sector separately within an SAM. Historically, the disaggregated Indonesia SAM of 1975 implicitly included both male and female labour via SAKERNAS labour force survey and paid and unpaid workers as well. Thus, it will be accurate to say that this SAM was a precursor of the other more recent SAMs characterized by the incorporation of the informal sector and gender within its structure through workers and household characteristics. In the methodological framework of application to FPM and CGE models, the SAM can be viewed as a tool for mapping production and distribution at the economy wide level.

The SAM summarizes succinctly the interdependence between productive activities, factor shares, household income distribution, balance of payments, capital accounts, etc. for the economy as a whole at a point in time. Given the technical conditions of production the value added is distributed to the factors in a determinate fashion. The value added accrued by the factors is further received by households according to their

ownership of assets and the prevailing wage structure. In the matrix form the SAM consists of rows and columns representing receipts and expenditures, respectively. As an accounting constraint receipts must equal expenditures.

As is elaborated further in Pyatt and Round (1979), Defourney and Thorbecke (1984), and Khan and Thorbecke (1988), the SAM framework can be used to depict a set of linear relationships in a fixed coefficient model. For deciding the question of determination within the model, the accounts need to be divided into exogenous and endogenous ones. For instance, in the South African SAM used by Khan (1989) to analyse the impact of economic sanctions on the South African economy, there are three endogenous accounts. These are factors, households and production activities, leaving the government, capital, and the rest of the world accounts as exogenous.[1]

In examining the poverty profiles – particularly in connection with gender and informal sector aspects – in any country, one particular set of accounts assume special importance. These are the household accounts. The proper flow of income and expenditures need to be recorded for these accounts if an accurate picture of poverty as inadequate income/consumption is to emerge out of a given SAM. For this reason, the classification of households needs special care. There are at least six aspects that need careful attention.

These six aspects are to:

(1) classify households by socio-economic characteristics;

(2) understand the income generation process by which the households receive their incomes;

(3) pinpoint the distributional mechanisms;

(4) understand the household consumption patterns;

(5) link household income and consumption to social capabilities and functioning; and

(6) estimate the resource generating capacity and resource absorbing capacity of the households.

If items (1)-(6) can be investigated systematically by combining economic and social modes of inquiry in a SAM, proper policy intervention for poverty reduction will become a more tractable exercise than it is at present. In particular, if disaggregated SAMs can be constructed at the local, sub-national levels, then intervention at the local levels may be much more effective than it has been historically in many cases. This is yet to be realized, but clearly is an important goal to pursue. We now turn to a discussion of another particular strength of the SAM framework for data gathering. SAMs have the consistency features that one needs in capturing economic flows for use in a general equilibrium framework.

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[1] See Khan and Thorbecke (1998: ch. III). The presentation here follows the cited work closely.

Table 1: Modular composition of the SAM

	Factors of production	Institutions	Production activities	Capital account	Indirect taxes	Rest of the world	Total
Factors of production			Income generation module			Factor income received from abroad	Total factor income received
Institutions	Income distribution module	Income redistribution module			Total net indirect taxes	Transfers received from abroad	Total disposable national income
Production activities		Domestic consumption module	Industrial transactions module	Domestic investment module		Exports	Total demand
Capital account		Domestic savings module				Balance of payments deficits	Total savings
Indirect taxes		Indirect taxes on final consumption	Indirect taxes on intermediate consumption	Indirect taxes on investment goods			Total net indirect taxes
Rest of the world	Factor income paid abroad	Imports of final consumer goods	Imports of intermediate consumer goods	Imports investment goods			Total payments abroad
Total	Total factor income paid	Total expenditure of the institutions	Total supply	Total gross investments	Total net indirect taxes	Total receipts from abroad	

2   SAMs as base for FPM and CGE analysis

In terms of the usefulness of the SAM information base, one can argue that the national SAM could be used for policy analysis by examining how any change would impact the economic well being of households who comprise of workers having informal and gender distinctions in an economy or in a region. It can be stated that with better understanding, growth without a human face is not sustainable. The starting point for an analysis based on FPM is the exogenous nature of the increased demand leading to sectoral output increase. The set of FPM can then be used to ascertain the impact of this increase in output on the incomes of specific household groups.

Looking at Tables 2 and 3 which represent a SAM, we can see immediately that:

$$y = n + x \qquad (1)$$

$$y = 1 + t \qquad (2)$$

If we divide the entries in the matrix T_{nn} by the corresponding total income (i.e., Y_n), we can define a corresponding matrix of average expenditure propensities. Let us call this matrix A. We now have:

$$y = n + x = Ay + x \qquad (2.1)$$

$$y = (1 - A)^{-1}x = Mx \qquad (2.2)$$

M can be called the matrix of *accounting* multipliers. These multipliers, when computed, can account for the results (for example, income, consumption, etc.) obtained in the SAM without explaining the process that led to them. Let us now partition matrix A in the following way:

$$A = \begin{pmatrix} 0 & 0 & A_{1.3} \\ A_{2.1} & A_{2.2} & 0 \\ 0 & A_{3.2} & A_{3.3} \end{pmatrix}$$

The SAM framework can be used to depict a set of linear relationships in a fixed coefficient model. This is the essential point behind FPM modelling approach based on a SAM. For deciding the question of determination of the equilibrium quantities, the accounts need to be divided into exogenous and endogenous, as in Table 3.

Table 2: Simplified schematic social accounting matrix

				Expenditures				
				Endogenous accounts			Exogenous	Totals
				Factors	Households	Technology production activities	Sum of other accounts	
				1	2	3	4	5
Receipts	Endogenous accounts	Factors	1	0	0	$T_{1.3}$	x_1	y_1
		Households	2	$T_{2.1}$	$T_{2.2}$	0	x_2	y_2
		Production activities	3	0	$T_{3.2}$	$T_{3.3}$	x_3	y_3
	Exog.	Sum. of other accounts	4	$1'_1$	$1'_2$	$1'_3$	t	y_x
		Totals	5	y'_1	y'_2	y'_3	y'_x	

Table 3: Schematic representations of endogenous and exogenous accounts in a SAM

		Expenditures				Totals
		Endogenous	Sum	Exogenous	Sum	
Receipts	Endogenous	T_{nn}	n	Injections T_{nx}	x	y_n
	Exogenous	Leakages T_{xn}	1	Residual Balances T_{xx}	t	y_x
	Totals	y'_n		y'_x		

Source: Khan and Thorbecke (1988).

Given the accounts factors, household and the production activities, now we see that the income levels of these accounts (call them y_1, y_2, and y_3 respectively) are determined as functions of the exogenous demand of all other accounts. In this respect, what we have is a reduced-form model which can be consistent with a number of structural forms. This is quite satisfactory as far as tracing the effects of a certain injection in the economy is concerned or for prediction purposes when the structural coefficients are more or less unchanged.

One limitation of the accounting multiplier matrix M as derived in equation (2.2) is that it implies unitary expenditure elasticities (the prevailing average expenditure propensities in A are assumed to apply to any incremental injection). A more realistic alternative is to specify a matrix of marginal expenditure propensities (C_n below) corresponding to the observed income and expenditure that prices remain fixed. Expressing the changes in income (dy) resulting from changes in injections (dx), one obtains:

$$dy_n = C_n dy_n + dx$$

$$= (I - C_n)^{-1} dx = M_c dx$$

M_c can be termed a fixed price multiplier matrix and its advantage is that it allows any nonnegative income and expenditure elasticities to be reflected in M_c. In particular, in exploring the macroeconomic effects of exogenous changes in the output of different product-cum-technologies on other macroeconomic variables, it would be very unrealistic to assume that consumers react to any given proportional change in their incomes by increasing expenditures on the different commodities by exactly that same proportion (i.e. assuming that the income elasticities of demand of the various socioeconomic household groups for the various commodities were all unitary). Since the expenditure (income) elasticity is equal to the ratio of the marginal expenditure propensity (MEP_i) to the average expenditure propensity (APE_i) for any given good i, it follows that the marginal expenditure propensity can be readily obtained once the expenditure elasticity and the average expenditure propensities are known, i.e.,

$$Ey_i = \frac{MEP_i}{AEP_i}, \text{ where } Ey_i \text{ is the income elasticity for}$$

$$MEP_i = Ey_i \, AEP_i$$

Thus, given the matrix A_{32} of average expenditure propensities, and the corresponding expenditure elasticities of demand, y_i the corresponding marginal expenditure propensities matrix C_{32} could easily be derived.

As a further example, one can mention the use of SAMs for poverty analysis. For analyzing poverty both at the national and the subnational levels these multipliers can be further decomposed in terms of their effects on poor households' incomes. Tracing out these effects can be computationally demanding, but under assumptions of distributional neutrality of growth, the pure effects of growth on poverty have been estimated by Thorbecke and Jung (1996) for Indonesia and by Khan (1999) for South Africa. The latter used the South African SAM described above and found that the lack

of human capital and more generally, basic capabilities in Sen's framework, was the main reason why growth left out the rural Black poor in particular.

Thus the FPM framework can handle short run modelling issues stemming from the incorporation of the informal sector and gender. Perhaps the work by Khan and Thorbecke on Indonesia is the clearest early example of this. But the pioneering work was done at Cornell in the early 1980s by Thorbecke and his collaborators. Khan and Thorbecke (1988) addressed the issues of sectoral disaggregation and informality simultaneously. The breaking up of production activities along the rows and columns according to the types of activities – formal or informal – is the key to this. Later work addressed the issue of labour types and household types as well. The same types of issues arise with respect to gender for labour types and household types and so far the solutions within the SAM and FPM type work are also along the same lines. It is important to reiterate that GEM are economy wide models and are multi-agent, multi-commodity models. Such models have the advantage of responding to shocks while fulfilling the conditions of optimality of agents' behaviour, technological feasibility, and resource constraints. In the 1970s there were major advances in solution techniques that permitted the application of GEM to actual data sets. With improvement in data collection and advances in computer technology and software, this has been increasingly used as an advanced methodology of applied policy work. The applied models are treated as a representation of reality. Economic theories form the basis to such models, namely, optimization behaviour, budget balance, and market clearing.

The advantage of uses of the CGE model is that it interconnects the general equilibrium effects of different policy options for example, see Taylor (1983), Shovan and Whally (1986, 1992), and Thissen (1998). For example a study by Narayana et al. (1991) shows that the combination of investment of infrastructure with welfare schemes such as food for work programme is a very effective way of reducing poverty compared to providing food subsidy. A study by Clarete and Roumasset (1990) examined trade liberalization for agricultural commodities and found that growth actually depends on the removal of quantitative restriction on industry. Simulation runs can be designed by using the CGE models so as to get various welfare findings. It is possible to determine the winners and losers due to change in policy; see Khan and Thorbecke (1989), Jung and Thorbeck (2001), Taylor (1990), Yau and Lie (2000), and Thorbecke (1992).

3   Informal sector and gender SAMs: recent examples in CGE analysis for India

A SAM is developed with the use of an input-output table. In India, the recent two IO tables produced by the CSO for 1993-1994 and later for 1999-2000 have been used to develop SAMs incorporating informal sector as well as gender distinctions. First the 114 sectors of the Indian input output tables are aggregated into lesser number of sectors for sharper analysis having informality and gender aspects driving the aggregation of sectors. While distinguishing the intermediate flow of goods into formal and informal parts, two aspects are to be considered. One is the input break up and the other the output break up. In case of input break up, the information on the enterprise surveys is used to distinguish the formal and informal parts of input requirement of a sector. The output break up into formal and informal parts are also computed using the enterprise surveys. The National Sample Survey Organisation (NSSO) employment and expenditure surveys provide information on the characteristics of the surveyed households on employment status and consumption expenditure. Workers are distinguished as casual, regular, own account workers (OAW), employers, and for the latter study, as home based workers.

The 1999-2000 NSSO of India collected data on home based workers for the first time and we have used the data for formulating the second Indian SAM having gender and informal sector distinctions. In identifying a firm as informal, it is difficult to use the size of the firm in building a CGE structure. Therefore this distinction is assumed to depend on its other characteristics such as lower capital-labour ratios, or lower output-labour ratios in the informal parts of an industry as compared to formal parts of the industry. We have characterized informal parts of the industry as having lower output-labour ratio and also hiring only casual labour. Casual labour has lower wages compared with regular labour, and are part of distinct household categories. Another major assumption has been that the informal sector does not pay any production tax to the government. However such firms can both import and export and are thus exposed to external shocks and trade reforms. The findings of our study depend on the major characteristics adopted while formulating the model.

Both the SAMs have also been used as a data base for developing CGE models.[2] The CGE models help through simulations to examine the impact of reforms (Dervis et al. 1982) on the economy. The gender focussed CGE model developed for the Indian economy (see Sinha and Adam 2000, and Sinha and Sangeeta 2003) extended the standard CGE model to examine the impact of external shocks on the informal workers and also on women workers. The augmented CGE model developed is of the type discussed in Devarajan et al. (1996), which are widely used trade focused models for developing countries. The CGE results inform us about the possible consequences of changes in trade policy for the distribution of income between the formal and informal factors and distinguished by gender and across a variety of household types. The other important feature of the past studies is the distinction of various types of households having expenditure classification as well. As noted a latter version of the gender model (Sinha et al. 2003) incorporated information on home based workers. Moreover capitalists are also distinguished by gender. Formal and informal capital owners are distinguished very carefully, keeping the CSO definition of formal enterprises in view.

It is to be recognized that the break up of the various parts of the SAM and the gendered households are the starting point in the building of a model. We have the results that indicate the majority of women workers being involved in the informal sector, so we recognize that informal sector analysis is important to get the right perspective on the situation of women in India; and, we suspect, in China, Brazil, and South Africa.

The initial probe into such a macro analysis (Sinha and Sangeeta 2000) reveals that the female work force constituting 26 per cent of the total labour force, and is mainly occupied in informal activities. Of the total female workers, including helpers or unpaid workers, about 92 per cent are involved in informal activities. Casual agricultural workers are 36 per cent of the total female work force and another 36 per cent are actually unpaid helpers, whereas for the male workers, 22 per cent are casual agricultural workers and only 12 per cent are unpaid helpers. A sectoral classification also shows that the females are mostly occupied in agricultural and related sectors. Within formal activities, women have the highest representation in education, scientific and research service sector, having 31 per cent of the total non-agricultural regular women workers occupied in this sector, most probably as teachers. The sectoral break

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[2] The SAM and CGE model specifications can be requested from Anushree Sinha: asinha@ncaer.org.

up of workers by gender has enabled us to carry out an input-output analysis and prepare the proposed SAM. Households with specified sex ratios have been formal in the SAM framework. The earnings of the female workers are low compared to their male counterparts on an average across all types of activities listed in the tables. The analysis so far reveals that females are mostly involved in low skill work. From the present study, the findings show that there is a large section of the Indian population involved in informal activities and further a large section of women are involved in such activities. There are certain sectors, which have more of women workers than others. Apart from the usual agriculture and livestock related activities it is found that mainly within formal activity women are involved in sectors such as education and health. This could imply that there are a higher proportion of women teachers and a number of women workers are employed as nurses in the health sector. The findings show that a large section of the Indian population is involved in informal operations. There are certain sectors, which have more of informal activities than others. Apart from the usual agriculture and livestock related activities we find that activities in textile production, wood and wood products, other manufacturing, manufacture of miscellaneous metal products, construction, and combined services also have substantial informal share in production. Share of informal worker in sectors like agriculture, construction, mining, manufactured food products, gur and khandsari, beverages, wood products and leather are higher than that of formal workers. Further, the study shows that there are more poorer households within the informal category.

The latter SAM and CGE (Sinha et al. 2003) distinguished gender-wise workers as homebased and non-homebased types as well. In this study, the SAM is developed having sectors that have high shares of women workers though these are mostly in the informal part of the sectors. Workers are distinguished in this study as casual, regular, own account workers, employers and home based workers. We processed the information and distinguished 12 factors of production, i.e., labour casual – female; labour casual – male; labour home based – female; labour home based – male; labour regular – female; labour regular – male; OAW – female; OAW – male; OAW home based – female; OAW home based – male; employer – female; employer – male.

This study attempts to examine the impact of policy changes on the welfare of women in India. First the macro analysis is developed to focus on the various economic agents in the economy having a gender distinction within a SAM framework. As a large section of women workers are involved in informal activities, we have differentiated factor of production by informality. The study distinguishes households deriving income from formal and the informal activities. SAM incorporating informal sectors and informal households enables a study of the work participation of women in different sectors of the economy. Also non-labour force work of women is scrutinized so as to know the structure of the various types of households and the women's contribution in such households. The flow of value added from different sectors to the various factors of production and the flow of factor income to different households on the basis of factor ownership differentiated by gender is incorporated in such a SAM. The SAM is used as a base for building a CGE model. The CGE model incorporates factors of production distinguished by gender and informality.

To analyse the impact of trade policy changes and certain pro-poor domestic policy change we have designed two simulations using the CGE model. The two simulations are – a decrease in tariff in the manufacturing sectors by 50 per cent, and an increase in direct taxes of formal rich households to compensate the decrease in tariff reduction as

in simulation 1. This keeps government revenue unchanged. We then study the impact of the policy changes as noted above on average wages, relative prices, Consumer Price Index (CPI), private consumption by households, domestic output, exports, imports, and an overall welfare measure.

The findings show that the tariff reduction leads to welfare gains (measured as rise in real consumption expenditure of households) in most households as prices fall. However the poorer households gain relatively more. This is because the casual wage rates fare better due to contraction in sectors where they are less concentrated. Interestingly as women are less concentrated as workers they benefit more than men wage earners. As we had mentioned earlier, in this study we have not examined the women workers who fall outside the labour force. So this is only a partial analysis. At the same time it is important to examine whether the policy changes are impacting the working (labour force) women adversely or not. The study shows that 'working' women do benefit in case of globalization. The findings show that as a result of removing the market distortion, there is overall welfare gain. More importantly poorer households benefit more than the richer ones. As we examine the wage differentials between genders we see that in most cases the gap reduces with import liberalization. However, progressive direct taxation does not have very positive impact as such a measure reduces overall demand. Therefore the growth of the economy is constrained by direct taxation and that had adverse impact on women as well.

Using the same data sources another SAM distinguishing formal and informal sectors and workers. Interestingly this SAM (Sinha et al. 2007) also used field survey data as well for rice and garment sectors to understand the worker relationships of informal workers in these sectors. This study conceptualized the term 'informal economy' by taking into account firms and workers not protected by any legislation. Given the wide range of activities under the rubric of informal activities, the parameters to describe the informal sector are very varied. The objective of this macro analysis was to define the macro aspects of the informal sector to enable a measurement of this sector's contribution to the economy. This is done first through the construction of an SAM, as reported in Sinha et al. (2007) and second, by using a CGE modelling approach to examine the economy-wide impact of trade reforms, as discussed in this paper (see Sinha and Adam 2006, 2007).

The case study result also informed a CGE model that was built based on the SAM. Here we have used information from case studies of the rice and garment sector to inform our assumptions (Harriss-White and Sinha 2007). These field studies have shown that many formal firms employ workers on a casual basis. Accordingly, we have designed the formal sector innovatively in the model such that it hires both regular (formal) and casual (informal) workers. Field work shows that there may also be price differences in the formal and the informal sub-sectors of an industry; so here we have treated the two sub-sectors as distinct with different production processes and pricing mechanisms. The prices of the formal part of an industry are formulated by incorporating production taxes. The informal parts do not have any such wedge.

This work was extended which looked at labour market dichotomy. The model built in wage rigidity in the formal labour market. This study could examine how trade reforms cause wages of casual workers to increase with full flexibility in both the labour markets specified in the study (namely formal and informal). This is because casual labour intensive sectors expand (conforming to the typical Heckscher-Ohlin conjecture) under

tariff reduction as erstwhile-protected sectors contract. However, when we impose wage rigidity in the formal labour market, the results differ. Specifically, when the demand for formal labour declines in these circumstances, some formal labour is laid off which then seeks employment in the casual sector, swelling the ranks of casual workers and bidding down their wages. The study shows that the very bindings, which result in greater expansion in the informal sector, namely the wage rigidity causes the informal sector wages to contract. A positive outcome could be obtained for the casual workers letting them attain the benefit from informalization, if the informal sector workers are protected through minimum/decent wage legislation. Though tentative, the model constructed delivers a number of important insights, most of which are consistent with the existing literature. We find that trade reforms (taken to include the removal of QRs as well as a tariff reduction) generate real GDP increases and welfare gains for informal households when no fiscal adjustment is required. These emerge mainly from improvements in real consumption wages (which themselves reflect falling domestic relative prices) and from the reallocation of labour demand from previously highly protected sectors intensive in formal employment to expanding sectors which are relatively intensive in informal (casual) labour. These results do, however, imply deterioration in the fiscal stance of between a half and three-quarters of one per cent of GDP in the case where there is no fiscal response to the trade reforms, and similar deterioration of the trade deficit. The results are interesting and conform with the preliminary data analysis from the 61st Round NSSO survey.

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Though tentative, the model as developed for India (Sinha and Adam 2006) constructed delivers a number of important insights, most of which are consistent with the existing literature. We find that trade reforms (taken to include the removal of QRs as well as a tariff reduction) generate real GDP increases and welfare gains for informal households when no fiscal adjustment is required. These emerge mainly from improvements in real consumption wages (which themselves reflect falling domestic relative prices) and from

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As an example to examine policy impact, the informal sector aware CGE model results bring to light that issue like the phasing out of the Multi-Fibre Agreement in 2005, could enhance competition for Indian exports. It was stated that with less bonding with the domestic economy, the garment sector could suffer substantial employment losses deteriorating the condition of informal workers further in terms. To make this sector globally competitive, flanking policies such as the reduction in tariff in India for intermediates such as synthetic fibres was a very critical policy decision.

4   Concluding remarks and future work

The social and human development impact of macroeconomic policy must look at how choice sets have been altered and how alterations have affected women and men. Both kinds of impact analysis, in turn, help determine the changes in the welfare of both genders. What determines status and control over resources? And what determines women's and men's choice sets? Households operate in an environment structured by economic incentives and institutional constructs. The analytical tool should be able to examine how, for example public expenditure on health services would directly and also indirectly impact the welfare of women, by providing better and economic health facilities closer at hand. Also by improving rural water supply the time used by women in fetching water can be hugely saved by reducing non-market work in the care sector,[3] and this time could be used in other productive or quality activities (learning skill, etc.) that would enhance the welfare of women. Women members could join market work and start on the path of empowerment. Younger women could enhance vocational skill and/or improve their level of education. Macro quantitative frameworks can be rigorous and make the impact of policies on different groups of sectors and individuals more visible to the policy makers.

While examining the impact of policy changes on non-market work one could analyse the outcome of social investment by the state. If because of social sector investment, some amount of personal care activities is transferred to the State; then women would benefit from such policy changes. This would also assist the State in evaluating and measuring the contribution non-market work is making to the overall economy. In addition to 'formalizing' the care sector, the time freed: from non-market work would lead to welfare gain. Social policy intervention such as higher investment in rural infrastructure or education or health would increase labour participation of women leading to expansion of their market participation which in turn would cause value added tax to rise. A higher value added base would lead to a higher source of taxing. This revenue in turn would help raise funds for social sector, thus starting a possible virtuous cycle for the less privileged women.

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[3] The participation of women in taking care of household members, including care of elderly, other members, children, cooking, tutoring etc. are termed as the care, sector by gender aware and economists.

We have tried to clarify very briefly some important links between the social accounting matrix, fixed price multiplier (FPM) models, and CGE models. The aim has been expository. We hope that this brief but historically accurate background and description of SAM and SAM-based fixed price multiplier and CGE models will be helpful to the increasing number of researchers who are interested in using SAMs for both FPM and CGE modelling. The examples given here could be multiplied easily since the already large literature is growing apace. Instead of surveying all the applications, the focus here has been on the exposition of a few significant aspects of SAMs, FPMs and the findings from SAM based CGE models for policy analysis.

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