Labor Supply of the Family: an optimizing behavior approach to microsimulation

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Content

Abstract

This is a draft on a baseline model for an optimizing behavior microsimulation module for simulating the time allocations on several base activities. The central aim of this module is to simulate the labor supply of family members, which maximize their joint utility.

1. Introduction

Microsimulation (MS) models have evolved substantially within the last decade. The applications are quite widespread. Within social sciences nearly all sub-disciplines have developed special methods in MS. For instance several game theoretic approaches were adopted within political sciences, adaptive-learning procedures within environments with uncertain progressions were imposed on economic models, the formulation of dynamic network modules, matching procedures and interacting agents modules came along with communication sciences and sociology etc. At this stage, where the methodology of microsimulation is a young and fast growing field, several new approaches and applications are published every month.

The model within this paper follows an optimizing behavior approach developed within three specialized fields of analytical microeconomics and tries to implement - or translate - the results of the theoretical analysis to a microsimulation environment. This translation is a much greater challenge then the development of the analytical model itself. Every theoretical microeconomist can raise several models to show some economic effects within the shielded-by-assumptions-world of each particular model. Within microsimulation no such shields are given. Every line of the underlying theoretical model will be tested in multiple respects within every simulation run. For that reason the set of inherent assumptions has to be reduced to an ultimate minimum. On the other side, within microsimulation the researcher comes to the position, where s/he can test cumulative effects of different models concerning different, separable issues. Labor supply and realized labor market participation - for instance - are main issues concerning the formation, persistence and enlargement of families and vice versa. This feedback relation, that is dependent on the variations of social norms and attitudes itself, is the main task of all simulation procedures within this area. Microsimulation goes even one step further: It allows to extent the heterogeneity of its virtual agents, so that not only some average effects, but also the distribution of the effects subject to a large set of distinctive features is educible.

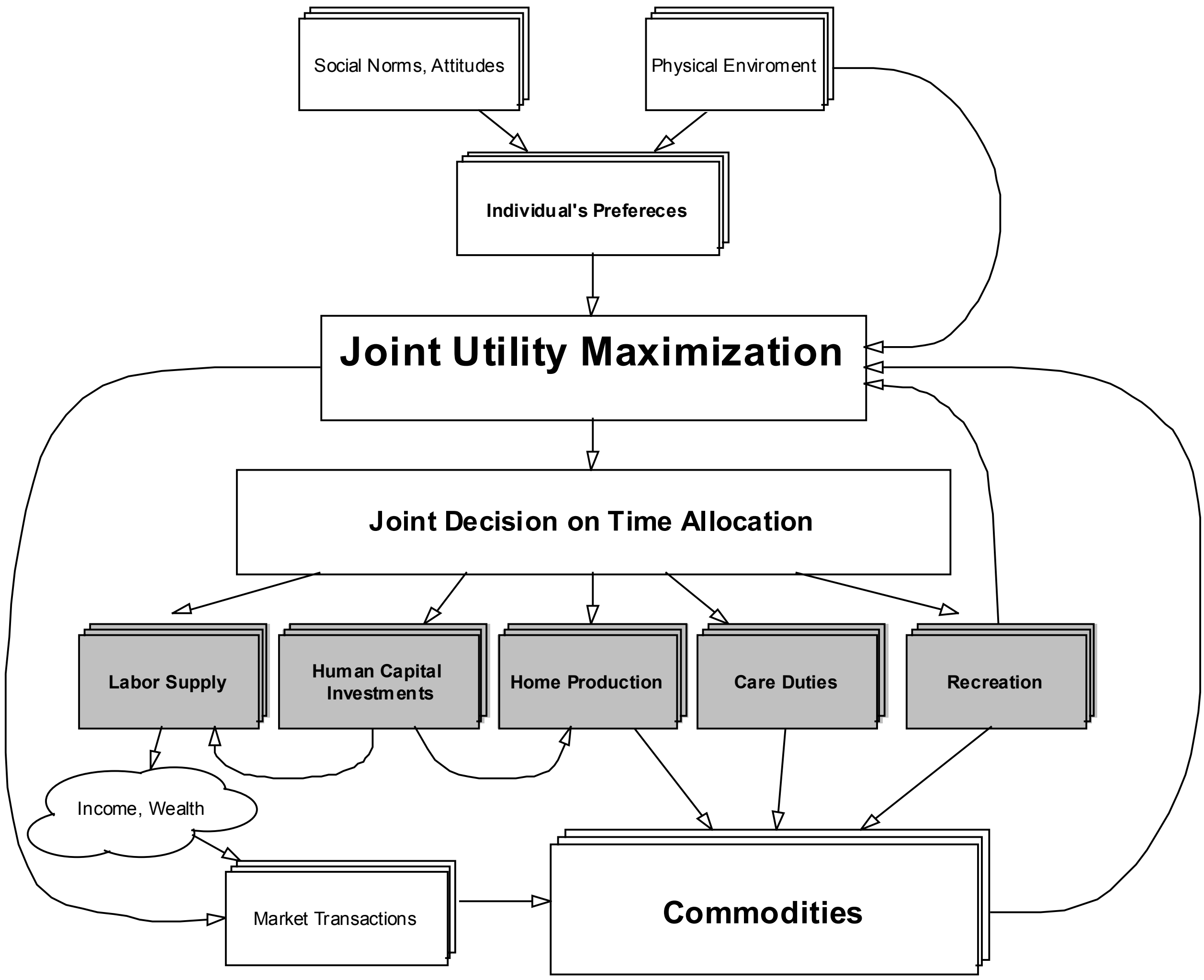
The aim of the developed model is to reflect the most important transitions within the professional life path of each family member as a function of his/her alternative activities. More concrete we will try to model and simulate the transitions

- from education to first main job,
- from trainee jobs to self-dependent positions,
- of leaving the labor force for additional education and returning afterwards,
- of changing the employer,
- of further professional career influenced by transitions of marital status,
- the likelihood of getting unemployed for at least one month,
- from professional status to paternal leave, elder care, exclusive home production and reentering the labor market again, and
- from labor market participation to retirement .

The outline of the paper is the following: First the model and its main implications within a comparative static environment will be represented. In the chapter 3 the main reasons and implementations for discounting within a dynamic environment are described. The dynamics of key issues of the model are discussed within chapter 4. The last chapter sketches the implementation of the model into a feasible microsimulation module.

2. Base Model – Static Version

As individuals try to maximize their (expected) utility within their family, the aim of the family as well it's – in it's widest definition - budget restrictions have to be regarded. Many approaches for modeling the process of decision within the family have been evolved yet. They range from sole decisions by the head of the family[1] over game theoretic approaches to various kinds of joint decisions by all family members. In this paper we concentrate on a model, where a joint utility is maximized and the decision process is left unobserved. So the decision process can be seen best as the decision of one altruistic person of favor of the whole family.



[1] BECKER 1981

Within the base model[2] the family maximizes its joint utility by allocating its total time available to different activities. Within this approach a (log-linear) Cobb-Douglas utility function containing the time use for the activities

- pure Recreation R_{it} ,
- final Consumption of market commodities C_{it} ,
- final Consumption of home produced commodities A_{it}
- Labor L_{it}

will be computed for each group of predefined family types, so that

(2.1) $$U_t = R_t^{\alpha_{Rt}} C_t^{\alpha_{Ct}} A_t^{\alpha_{At}} L_t^{\alpha_{Lt}} ,$$

respectively, regarding each family member,

(2.2) $$U_t = \prod_i R_{it}^{\alpha_{iRt}} C_{it}^{\alpha_{iCt}} A_{it}^{\alpha_{iAt}} L_{it}^{\alpha_{iLt}} \equiv \sum_i (\alpha_{iRt} \ln R_{it} + \alpha_{iCt} \ln C_{it} + \alpha_{iAt} \ln A_{it} + \alpha_{iLt} L_{it})$$

where $\sum_k \sum_i \alpha_{ikt} = 1; k = \{R, C, A, L\}$ for each point of time.

2.1. Activities in the static model

The most incisive difference to conventional models of the household sector is the fact, that the gains from the *activities* of consumption, regeneration etc. are maximized. These activities are costly – each needs at least time.

2.1.1. Consumption

For that reason, the activity of consumption is as well restricted by the time budget and by income. The activity of consumption reflects exactly the final usage of a commodity. The time needed for selecting, buying, transporting and preparing the commodity for final consumption is considered as time for home production. The consumption activity is considered as a linear function of the number of market commodities.

(2.3) $$C_{it} = \tau_{it} M_t ; C_t = M_t \sum_i \tau_{it}$$

[2] This section is heavily oriented on the model in A.CIGNO (1991). Some extensions were made, but this model still follows “the spirit” of the Cigno-model

2.1.2. Care Duties

Another branch of commodities are all care duties[3]. Family members care for each other – especially parents for their children - and for persons outside the (core) family. Intergenerational transfers of time (e.g. caring for grandparents) as well voluntary care for other persons are included. Some care duties can of course be exchanged on markets, so that they are considered as consumption.

2.1.3. Home Production

These commodities have to be produced by certain family members. The activity of home production contains the time used for market transactions, combining these goods and services to ready-to-consume commodities, care for other family members, as well household work.

(2.4) $$HP_{it} = \tau_{iCt} C_{it} + \tau_{iAt} A_{it} + \tau_{iRt} R_{it}$$

where (τ_k) reflects the time use to produce each unit of the commodity. As household work is also a tradable commodity, the time use of all family members needs not to sum up to the total time amount required[4]. Note that recreation is also a necessary commodity of home production.

2.1.4. Human Capital Creation and Labor

The human capital stock (H_{it}) of a person evolves from her first day of life. The accumulation of human capital is an autodidactic procedure as well a process of learning from family members and/or education institutions or the environment.

(2.5) $$H_{it} = \sum_t \frac{1}{\delta^t} Z_{it}$$

[3] for simplicity these care duties are further just called “child care”

[4] household work within other households is either considered as external care duty or as labor with $w \geq 0$

The human capital investment in a certain period (*Z_{it}*) will be depreciated if not repeated by usage in the following periods[5].

Labor produces the benefit of a salary, but it rises costs of working hours, time for organization, traveling time to and from work etc., so that the activity of labor[6] has to be expanded analytically to (2.6) $L_{it} = \tau_{iLt}\overline{L}_{it}$, where $\tau_{iLt} > 1$. The price of labor therefore is identified by (2.7) $w_{it} := \overline{w}_{it} - \tau_{iLt}$.

2.1.5. Recreation

The time use for all activities sums up to a certain amount. The difference to total time within a time interval is considered as (pure) recreation. For each individual a certain minimum recreation time per period as a function of its present endowments (2.8) $\overline{R}_{it} := f(E_{it})$ has to be defined. The additional recreation ($\tilde{R}_{it}$) is aim of utility maximization.

(2.9) $$R_{it} = \tilde{R}_{it} + \overline{R}_{it}$$

2.2. Budget Restrictions within the static model

The utility function is subject to two main restrictions. First the total amount of time is fixed for each discrete time period for each person. So the total amount of time available for the whole family is a linear function of the number of its members

(2.10) $$T_t = 24 * (days\_in\_month) * n_t \approx 730.5 * n_t,$$

which is completely utilized by the activities defined plus the activities labor and human capital investment.

(2.11) $$T_t = \sum_i (R_{it} + C_{it} + A_{it} + L_{it} + Z_{it})$$

[5] Within the static approach, no investments in human capital will be rational, because the gains of these investments would fall into the next periods. For that reason, human capital accumulation will first be considered within the dynamic model.
[6] The activity 'labor' is considered rather as economic good then as economic bad; analytically both signs are possible

The (conventional) budget restriction reduces at the utilization side[7] rather to the quality then the quantity of consumption, professional child care and human capital investment.

(2.12) $$I_t = \sum_i (p_{C_t} C_{it} + p_{Z_t} Z_{it})$$

Prices are considered as relative prices in respect to wages[8], where

(2.13) $$p_k := \pi_k \sum_i L_i / \sum_i w_i L_i \ ,$$

so that prices are represented in terms of labor input times the intra-family average wage rate.

At the income formation side the family is restricted to all work income, the capital income as well as public and private transfers received respectively given.

(2.14) $$I_t = \sum_i (\overline{w}_{it} L_{it}) + i_t W_t + TR_t$$

Together these budget constraints are symbolized by $B := f(I,T)$. Therefore the indirect utility of the family yields

(2.15)

$$V_t(\overline{p};B) = B_t \prod_i (\tau_{iRt}^{-\alpha_{iRt}} \hat{p}_{iCt}^{-\alpha_{iCt}} \tau_{iAt}^{-\alpha_{iAt}} w_{iLt}^{-\alpha_{iLt}}) \equiv \ln B_t - \sum_i (\alpha_{iRt} \ln \tau_{iRt} + \alpha_{iCt} \ln \hat{p}_{iCt} + \alpha_{iAt} \ln \tau_{iAt} + \alpha_{iLt} \ln w_{iLt})$$

, where $\hat{p}_{iCt} := (\tau_{iCt} + p_{Ct})$.

The expenditure function identifies with

(2.16) $$E_t(\overline{p_t}; \bar{U}_t) = \bar{U}_t \prod_i (\tau_{iRt}^{\alpha_{iRt}} \hat{p}_{iCt}^{\alpha_{iCt}} \tau_A^{\alpha_{iAt}} w_{iLt}^{\alpha_{iLt}}) .$$

Over Roy's Identity the uncompensated demand for the activities is stated by

(2.17)
$$R_t(\overline{p_t}; B_t) = B_t \prod_i \frac{\alpha_{iRt}}{\tau_{iRt}}$$
$$C_t(\overline{p_t}; B_t) = B_t \prod_i \frac{\alpha_{iCt}}{\hat{p}_{iCt}}$$
$$A_t(\overline{p_t}; B_t) = B_t \prod_i \frac{\alpha_{iAt}}{\tau_{iAt}}$$
$$L_t(\overline{p_t}; B_t) = B_t \prod_i \frac{\alpha_{iLt}}{w_{iLt}}$$

the compensated demand by

[7] The prices for market transactions are considered as equal for all family members.

[8] The inverse of real wages

(2.18)

$$h_{Rt}(\bar{p};\bar{U}_t)=\bar{U}_t\prod_i(\alpha_{iRt}\tau_{iRt}^{(\alpha_{iRt}-1)}\hat{p}_{iCt}{}^{\alpha_{iCt}}\tau_{iAt}^{\alpha_{iAt}}w_{iLt}{}^{\alpha_{iLt}})$$

$$h_{Ct}(\bar{p};\bar{U}_t)=\bar{U}_t\prod_i(\tau_{iRt}^{\alpha_{iRt}}\alpha_{iCt}\hat{p}_{iCt}{}^{(\alpha_{iCt}-1)}\tau_{iAt}^{\alpha_{iAt}}w_{iLt}{}^{\alpha_{iLt}})$$

$$h_{Rt}(\bar{p};\bar{U}_t)=\bar{U}_t\prod_i(\tau_{iRt}^{\alpha_{iRt}}\hat{p}_{iCt}{}^{\alpha_{iCt}}\alpha_{iAt}\tau_{iAt}^{(\alpha_{iAt}-1)}w_{iLt}{}^{\alpha_{iLt}})$$

$$h_{Lt}(\bar{p};\bar{U}_t)=\bar{U}_t\prod_i(\tau_{iRt}^{\alpha_{iRt}}\hat{p}_{iCt}{}^{\alpha_{iCt}}\alpha_{iAt}\tau_{iAt}^{\alpha_{iAt}}w_{iLt}{}^{(\alpha_{iLt}-1)})$$

2.3. Comparative Statics

If the environment changes in some respect, the family would react adequately by adjusting its demand according to the functions above. Just some changes in environment are investigated here. Every change in environment has an impact on prices, wages, costs of household production and/or value of recreation. These impacts have to be investigated.

2.3.1. Adjustments to Wage Changes

First, changes in wages of a family member would lead to an adjustment of all activities. The substitution effect on the compensated demand is strictly negative when ($j=i$) and can be positive (or remain zero) when ($j\neq i$). The income effect is (weakly) positive in either case ($j\in i:=\{1...n\}$)

(2.19)

$$\frac{\partial R_t}{\partial w_{jt}}=\sum_i\left(\frac{\partial h_{R_{it}}}{\partial w_{jt}}-\frac{\partial R_{it}}{\partial I_t}L_{jt}\right)$$

$$\frac{\partial A_t}{\partial w_{jt}}=\sum_i\left(\frac{\partial h_{A_{it}}}{\partial w_{jt}}-\frac{\partial A_{it}}{\partial I_t}L_{jt}\right);$$

$$\frac{\partial C_t}{\partial w_{jt}}=\sum_i\left(\frac{\partial h_{C_{it}}}{\partial w_{jt}}-\frac{\partial C_{it}}{\partial I_t}L_{jt}\right)$$

$$\frac{\partial L_t}{\partial w_{jt}}=\sum_i\left(\frac{\partial h_{L_{it}}}{\partial w_{jt}}-\frac{\partial L_{it}}{\partial I_t}L_{jt}\right)$$

As long as no further assumptions are made, the combined effect for the whole family is ambiguous. Due to multiple threshold effects, especially concerning sticky labor demand, marginal variations of wages are not expected to cause significant changes within these variables.

2.3.2. Adjustment to Price Changes

Individuals have even less influence on changes of market prices than on wage adjustments. Within this baseline model both are considered as exogenous as factor and commodity markets are assumed to be competitive.

(2.20)

$$\begin{aligned}
\frac{\partial R_t}{\partial p_{M_k t}} &= \sum_i \left(\frac{\partial h_{R_{it}}}{\partial p_{M_k t}} - \frac{\partial R_{it}}{\partial I_{it}} M_{kt}\right) \\
\frac{\partial A_t}{\partial p_{M_k t}} &= \sum_i \left(\frac{\partial h_{A_{it}}}{\partial p_{M_k t}} - \frac{\partial A_{it}}{\partial I_{it}} M_{kt}\right) \\
\frac{\partial C_t}{\partial p_{M_k t}} &= \sum_i \left(\frac{\partial h_{C_{it}}}{\partial p_{M_k t}} - \frac{\partial C_{it}}{\partial I_{it}} M_{kt}\right) \\
\frac{\partial L_t}{\partial p_{M_k t}} &= \sum_i \left(\frac{\partial h_{L_{it}}}{\partial p_{M_k t}} - \frac{\partial L_{it}}{\partial I_{it}} M_{kt}\right)
\end{aligned}$$

2.3.3. Adjustments to Changes in Costs of Household Production

The timeshares needed to produce one unit of a home produced commodity are state and/or time dependent. For instance the time needed for child care decreases with age of the child.

(2.21)

$$\begin{aligned}
\frac{\partial R_t}{\partial \tau_{jAt}} &= \sum_i \left(\frac{\partial h_{R_{it}}}{\partial \tau_{jAt}} - \frac{\partial R_{it}}{\partial I_{it}} A_{jt}\right) \\
\frac{\partial A_t}{\partial \tau_{jAt}} &= \sum_i \left(\frac{\partial h_{A_{it}}}{\partial \tau_{jAt}} - \frac{\partial A_{it}}{\partial I_{it}} A_{jt}\right) \\
\frac{\partial C_t}{\partial \tau_{jAt}} &= \sum_i \left(\frac{\partial h_{C_{it}}}{\partial \tau_{jAt}} - \frac{\partial C_{it}}{\partial I_{it}} A_{jt}\right) \\
\frac{\partial L_t}{\partial \tau_{jAt}} &= \sum_i \left(\frac{\partial h_{L_{it}}}{\partial \tau_{jAt}} - \frac{\partial L_{it}}{\partial I_{it}} A_{jt}\right)
\end{aligned}$$

2.3.4. Adjustments to Changes in Required Recreation Time

Finally, when adjusting recreation time (within the home production function), similar effects can be seen.

(2.22)
$$\frac{\partial R_t}{\partial \tau_{jRt}} = \sum_i \left(\frac{\partial h_{R_{it}}}{\partial \tau_{jRt}} - \frac{\partial R_{it}}{\partial I_{it}} R_{jt}\right)$$
$$\frac{\partial A_t}{\partial \tau_{jRt}} = \sum_i \left(\frac{\partial h_{A_{it}}}{\partial \tau_{jRt}} - \frac{\partial A_{it}}{\partial I_{it}} R_{jt}\right)$$
$$\frac{\partial C_t}{\partial \tau_{jRt}} = \sum_i \left(\frac{\partial h_{C_{it}}}{\partial \tau_{jRt}} - \frac{\partial C_{it}}{\partial I_{it}} R_{jt}\right)$$
$$\frac{\partial L_t}{\partial \tau_{jRt}} = \sum_i \left(\frac{\partial h_{L_{it}}}{\partial \tau_{jRt}} - \frac{\partial L_{it}}{\partial I_{it}} R_{jt}\right)$$

Each partial effect (substitution and income effect) for each family member has to be calculated separately and assembled to the general outcome for the family member who is targeted directly ($i = j$), the other family members ($i \neq j$) as well the whole family ($j \in i = \{1...n\}$). These effects depend primarily on the actual parameterization of the joint utility function. The aim of this step is to identify the limits of parameterization to "predict" the desired changes of activities within the comparative static environment.

3. Introducing Dynamics to the Base Model

The effects sketched above arise in a static world. To simulate adjustment processes, that are nearer to observation, several kinds of discount and distortion factors, decelerators as well accelerators have to be implemented.

3.1. Imperfect Foresight

As in general the foresight of transitions in far future (t_0+s) is significantly less perfect than the foresight of what happens next month (t_0+1), the dynamic aspect of decisions at each point in time (t) can be reduced continuously with the time span (s) the risk-averse family tries to maximize ($\lim_{s \to \infty} U_s \cong 0$). Due to this imperfect foresight a planning horizon has to be identified. Of course the individuals also try to influence their future environment far beyond this planning horizon by making long-term investments in human capital and real endowment, but these investments are rather made to reduce long-term uncertainty resp. increase their strategic position then to increase instantaneous utility.

3.2. Time Preference

The family maximizes its utility for all future periods ($t=t_0 \ldots s$), where states can be expected with some degree of certainty.

(2.23) $$U = \sum_{t=t_0}^{s} \frac{1}{(1+\rho)^t} U_t(.)$$

3.3. Anticipated Alternative Developments

As long as the preferences and the environment of the family do not change, the demand for the considered activities will not change either. If some component of the environment, the budget restrictions and/or the family structure does change, the demand will to be adjusted from the point of time the family knows about the changes with sufficient certainty[9]. Regarding these aspects the general utility function has to be extended to

(2.24) $$U = \sum_{t=t_0}^{s} \frac{1}{(1+\rho)^t}(U_t(.) + E(\Delta U_t(\Delta x))),$$

where all expectable transitions are taken into consideration.

(2.25) $$\begin{aligned} E(\Delta U_t(\Delta x)) &= U_t(\prod_{t=t_0}^{s} Pr^e(\Delta x_t)) \\ \Delta x_{t_1} &= \sum_{t=t_0}^{t_1 \le s} \sum_m \delta_{(t-t_0)} x_m \end{aligned}.$$

3.4. Risk Aversion

Even when some possible future outcomes can be anticipated and weighted by their (today's) probability, other outcomes are not foreseeable and/or the weight cannot be estimated with feasible accurateness. For this set of outcomes, a quota of remaining uncertainty has to be added. Beyond discounting and taking risk aversion due to imperfect foresight into account, some properties should be stated explicitly: First, a positive effect within the comparative static environment can never get negative within a dynamic framework et vice versa when just discounting the time preference. Second, in contrast risk aversion can completely offset an effect identified within comparative static environment. Reductions in labor supply due to rise in income of other family members can be totally offset by risk aversion of a negative screening effect.

3.5. Goal Orientation

So far, the utility optimizing family just reacts to exogenous changes. Beyond that, the family also plans certain activities and/or structural changes for longer periods. The timing of retiring is typically planned in advance. The timing of getting an addi-

[9] But asymetric reaction paths due to risk aversion have to be considered.

tional child, the decision who participates for how long in paternal leave programs, the choice of additional professional child care etc. are subject to medium and long-time plans.

The synthesis of these plans depends first on the degree of goal orientation of the family's members. Long term goals of a family can for instance be getting and raising children ("family oriented" goals), succeed in the job ("profession oriented" goals), raise wealth, participate in cultural life, learn languages and travel around etc. The more these goals match within the family and the more heavily they are supported individually, the more concrete the family's attempt to take its future in its own hand will be. As this model just treats with joint utilities, just the resulting concreteness of goals is implemented.

3.6. Aggregated Effects

In empirical studies these reasons for discounting cannot be distinguished, but within a microsimulation model, where agents with varying strengths of goal orientation, unequal degree of risk aversion, diverse time preference and different space of foresight etc. are simulated, they have to be separated. To keep that stage of model simple, just the aggregated effect is considered.

(2.26) $$U = \sum_{t=t_0}^{s} \frac{1}{\beta^t} U_t(.)$$

4. Dynamics of Key Issues

With the instruments described above, the dynamics of the key issues of the static model can be characterized. In order to describe rather the idea of translating the developed model to a microsimulation environment then its techiques, his section is deliberately held less technical.

4.1. Family Structure

Modifications within the family structure are subject of another module of the FAMSIM+ project. Within the Time Use / Labor Supply module the family structure is either assumed as fixed for the whole time horizon of the family (t_0…..s) or structural changes are foreseen with certainty.

4.2. Primary Human Capital Formation

Simulating primary human capital formation is also the key issue of another FAMSIM+ module[10]. Within this module the education path within primary and secondary level of schooling, the decision whether to continue school or to begin an apprenticeship and the decision to begin an education at academic level is simulated.

Although already this stage of human capital formation is part of an inter-temporal joint utility maximization process, the model within this module relies completely on descriptive empirics form various surveys aiming on this topic. In later stages of FAMSIM+ it will still be possible – and, as expected, very reasonable – also to implement a human capital optimization procedure, which fits the transition possibilities of the descriptive approach.

[10] See Schmid/Schwarz/Spielauer (2002)

4.3. Labor Market Participation

Simulating the labor market participation is primarily a task for agent-based microsimulation on individual level. Within this model, the agents – the families – try to maximize their input-output ratio for the present or the expected family structure within foreseeable future.

4.3.1. First Entry to the Labor Market

The first entry to labor market depends mainly on the human capital accumulation path. In Austria the ratio of young people entering the labor market in form of apprenticeships at age 14-17 is relatively high (about 34%). This form of labor market participation is rather a form of primary human capital formation than conventional labor (with just on-the-job-training), but it determines the further labor market participation significantly, so that within a decision for an apprenticeship the agents have also opted their professional status for quite a long time.

Entries after leaving school show a more "instable" participation history. Returning to another education (colleges, universities, short-term courses) is more likely compared with young people having completed their apprenticeship. In general, young people who are in the process of leaving the family and are going to settle their own household, should be treated differently within the joint utility maximization. At least here the exchange relation of family members has to be extended by altruistic motives[11].

[11] Most models within family economics resp. "new home economics" deal with altruism. Within a strict joint utility model altruism is no issue. When investigating inter-household relations of (former) family members, altruism has to be induced. For a detailed discussion on altruism see MASSON/PESTIEAU in ERREYGERS/VANDEVELDE (1997)

4.3.2. Job Changes, Unemployment and Job Search

Search theory has grown to an important subbranch of labor economics[12]. Within this approach the motives for job changes are nearly as widespread as in reality. They range from job search after notice of termination by the employer, over reactions to occurred or predictable variations within the work environment, changes in costs of home production to looking for better opportunities for further professional career etc. Hazard driven search models exhibit the considerable advantage, that they fit – from the technical point of view - perfectly into the survivor analysis environment of microsimulation techniques.

4.3.3. Leaving Employment for Additional Schooling

Comparable to job search, investments in human capital can be modeled as consequence of changes within labor environment and/or expectations of future developments. These investments can gain in an instantaneous positive contribution to utility - additional education as an economic good per se – and/or in an improvement in any future activity.

4.3.4. Leaving Employment for Exclusive Home Production

Like in the comparative static approach, variations in the price vector can cause a dampening of labor supply, but in most cases threshold effects lead to an entire exit from labor markets.

4.3.5. Leaving Employment for Retirement

These threshold effects can also be a function of age, but in many cases retirement obviously is the outcome of some utility maximization process. This can be a result of a backward bending labor supply curve: When no more improvements in labor - re-

[12] For a detailed survey on search theory see e.g. MORTENSEN in ASHENFELTER/LAYARD (1986)

garding income, professional career and/or social status - can be made, other utility gaining activities will be stressed. Even with some loss of income, the expected utility from leaving labor force earlier can dominate alternative strategies.

4.4. Home Production and Care Duties

Home production can be seen as inverse mirror of labor supply. Like in the comparative static environment, changes of home production and labor due to partial variations within the price vector go the opposite direction. As mentioned above, this effect cannot be revolved by discounting time preferences, it just can be quenched by risk aversion. Changes of the activity of home production is typically rather reactive to variations in environment, so that goal oriented shifts to more home production should be the exeption.

The only goal oriented and – more or less – precisely planned temporary increase in home production can be seen in getting and raising children and in foreseeable care duties in favor of elder or sick family members. At the end of the day an optimal result of all aims of the family should be sketched, including the optimal size of the family - the desired number of children.

5. Summary and Outlook: Implementation within a Microsimulation Model

The general aim of this model is to sketch agent's behavior by employing standard microeconomic analytics developed in the fields of new home economics, labor economics and neo-institutionalism. Having identified the form and parametrisation of the family's utility function (respectively - versa duality - its cost function), the reaction to changes within the family's environment is – in theory - clear without ambiguity. Modeling the adjustment process to the new optimal levels of activities will require another set of restrictions – call it torpidness-restrictions – which seem to be underrepresented in microeconomic analysis yet. Imperfect foresight and risk aversion do not suffice to explain adjustment processes seen in the data. Adding feasible torpidness-restrictions, parts of the observed transition processes should become more explainable and implementable into a microsimulation module. So the transitions and – in contrast – state durations of the agents regarding the variations of their distribution of base activities will be simulated. A further diversification of activities seems to be counterproductive, as the unambiguousness of the effects on several akin activities cannot be guaranteed. On the other hand the distinction between home production and market transactions (instead of combining them to “production in general”) as well as between consumption and recreation (instead of combining them to “leisure”) is functional for this kind of analyses.

The main challenge of this model is indeed the identification of utility resp. cost functions. These functions can just hardly be identified by identifying revealed preferences, as we do not have data on individual supply and demand patterns with different price relations (at one point of time within the same environment – just to be exact). But as we know some reactions from panels and event history data, we are in the position to identify some crude distributions of utility function classes. These classes can be interpolated and multiplied with a growing sample size.

This attempt seems to be too sophisticated to realize it yet. Additional mircoanalytical work has to be done to reduce the model structure to the essentials. Apart from that, the possible and reasonable heterogeneity regarding the distribution of activities within the starting population has to be investigated.

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