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Economic Perspectives on the Income Taxation of Couples and the Choice of Tax Unit : A Review of the Literature

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Economic Perspectives on the Income Taxation of Couples and the Choice of Tax Unit

A Review of the Literature

Expertise für den Zweiten Gleichstellungsbericht der Bundesregierung

gleichstellungsbericht.de

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Ludwig-Maximilians-Universität München
2015

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■abstract (3-4 sentences)■

This paper examines the case for replacing joint income by individual income as the base for the taxation of two-earner families. It draws upon well-established economic theory to support the argument. This shows that individual taxation is superior to joint taxation ("income-splitting") on grounds of both efficiency and equity. It also briefly reports on important recent empirical work that shows that in Germany moving from joint to individual taxation while at the same time increasing the availability of affordable pre-school child care would be self-financing and have a positive net social benefit.

Executive Summary

Part 1 of the Expertise surveys the theoretical literature on the comparison between joint and individual income as the tax base for couples. The early work, based on the Ramsey principle, established the superiority of individual income on efficiency grounds, essentially because income splitting equalises the marginal tax rates of the two earners in the household, while their labour supply elasticities are significantly different. This is largely because the second earner, typically a woman, has an additional margin of substitution, that between market and household work. More recent research suggests that individual taxation is very likely to be superior on equity grounds also.

In most households primary earners work full time but there is a great deal of heterogeneity in second earner labour supply. Moving from joint to individual taxation shifts some of the tax burden away from low wage households in which the second earner has a high labour supply, towards those households with a high wage primary earner and a (potential) second earner with a market labour supply at or close to zero. Given the importance of household production as an economic activity, total household labour income is a misleading indicator of household wellbeing. Much more relevant is the sum of this income and the value of household production. Moving to individual income as the tax base is in effect an indirect way of taxing otherwise untaxed household production.

This part of the Expertise also critically surveys a number of contributions suggesting that the efficiency arguments for the superiority of individual over joint taxation either do not apply, or may not apply in some regions of the parameter space of the models. In my view these papers are not successful in overturning the "conventional wisdom" of the earlier literature, for reasons set out at length in the Expertise. The papers by Piggott and Whalley (1996)[1] and Corneo (2013), which claim to demonstrate the superiority of joint taxation, are based on assumptions which in my view greatly restrict the relevance and applicability of their results. Papers based on non-cooperative models of the household do not prove the superiority of joint

[1] References are given in full at the end of the Expertise.

taxation, but rather show that where the tax system is based on individual incomes, it may be optimal to tax women (second earners) at a higher rate than men (primary earners). In my view the conditions under which this would hold are not satisfied in the German economy.

The second part of the Expertise surveys the empirically-oriented literature. There are several papers, using models calibrated on German data, which demonstrate the welfare gains of the switch from income splitting to individual taxation in Germany. In particular the recent paper by Fehr and Ujhelyiova (2012) uses a computable dynamic, stochastic, overlapping generations general equilibrium model to show that a switch from joint to individual taxation accompanied by appropriate policies to improve child care availability would increase both aggregate welfare and fertility. This model seems to me to represent the state-of-the-art in models of this kind, as well as being well-calibrated to German data.

Finally, I discuss some studies from outside Germany. In particular, I searched for empirical work on the consequences of the move from joint to individual taxation in the UK in 1990. Unfortunately there do not seem to be any studies that address this change directly. The picture is complicated by this being one of a series of important tax/benefit reforms that took place over the late 1980's-early 1990's, while the UK economy went into recession in the 3rd quarter of 1990, with negative growth for the following year and a slow recovery thereafter. The raw data show that female employment remained flat over this period while male employment fell sharply. A study by Blundell et al. (1998), controlling for demand-side factors, found that labour supply elasticities of women over this period were high enough to support the argument that a reduction in their marginal tax rates would lead to a significant increase in their labour supply. This appears to have taken place steadily since the mid-1990's.

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I. Introduction

The economic theory of taxation sees taxes as having two main effects: first, they distort the decisions people make concerning the activity being taxed, and secondly, they cause a loss of wellbeing, usually referred to as "utility", because of the loss of real income resulting from paying the tax. For example a tax on employment income may cause people to reduce the number of hours they work, or choose jobs requiring lower levels of effort and responsibility, or even leave the labour force entirely, and these are usually called the "(dis)incentive effects" of the tax. Paying a tax will also obviously reduce how much one can spend on consumption goods and saving, and so make one materially worse off. Moreover, the structure of the tax system, the set of rules determining how taxes have to be paid, inevitably means in practice that a tax will have different effects on different people, and an important area of tax analysis in economics is to try to clarify how the incentive effects and effects on wellbeing are distributed across the population being taxed.

These are the main factors that determine how a tax system should optimally be designed, as economists see it. We should try to find the appropriate balance between: keeping down the cost of the distortions to incentives on the one hand, and taking account of society's views concerning the fairness or equity of the distribution of the burden of taxation across the population on the other.

Although there is a very large economics literature concerned with analysing income taxation along these lines, only a small part of it is concerned with income taxation in the context of the family, despite the fact that the majority of taxpayers live in family households, defined broadly to mean households consisting of at least two adults with or without dependent children, or of one adult with one or more dependent children. The reason for this is that the body of economic theory that tax economists normally draw upon was developed for the case of a single decision taker, dividing his[2] time between work and leisure, and using the income from employment to buy goods and services for his own consumption.

[2] In all but the most recent textbooks, the decision taker is always a man.

The obvious descriptive inaccuracy of this model was sometimes recognised, increasingly so as over the 1960's to 1980's family structures changed dramatically, with falling fertility and increasing female labour force participation. Nevertheless, the temptation was strong to try to analyse issues of income taxation *as if* the family could be treated as a single individual, so that standard methods and techniques could be applied. This is still the dominant approach,[3] but at least over the past three to four decades some economists have tried to develop models of family decision taking and to apply them to issues in family taxation.

The stimulus for this work, and its central theme, has been the issue of the choice of tax base for the personal income tax system, whether this is to be joint or individual income in the prototypical two-earner household. This body of work will be the focus of the present review. The following section outlines the main characteristics of the types of income tax system that are typically in existence.[4] Section III reviews some theoretical literature on the arguments for and against these alternatives for the design of a family taxation system, while Section IV gives a brief discussion of some of the empirical work done by German authors on the costs and benefits of switching from joint to individual taxation, and Section V concludes.

II. The Structure of Tax Systems

The personal income tax systems of virtually all countries take what economists call a "piecewise linear" form. The type of income designated as the base of the tax system is divided into brackets, the lowest bracket is usually exempt from taxation, and then there is a series of increasing tax rates, called the marginal rates, that are constant within each successive bracket.[5] The only apparent exception to this is the German tax system. Here, within the middle two of four tax brackets the tax rate increases linearly with income. This is an important feature of the tax system from the point of view of the present paper and will be further discussed below.

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[3] See for example the most recent book by a leading tax theorist, Tuomala (2016).

[4] Tax theorists also consider forms of tax systems, usually referred to as "nonlinear taxation" that have no exact real world counterparts, the aim being to explore more general ideas of how tax systems could and should be structured.

[5] This is true of the formal tax systems. However in many countries, certain kinds of transfers, for example child benefits or support payments to low-income workers, are withdrawn as the household's income increases, and this can cause *effective* marginal tax rates to be higher over lower ranges of the income distribution.

In the majority of countries, the tax base for two-earner households is the individual income of each earner. In principle, it is quite feasible to apply a different schedule of tax rates and income brackets to the income of each earner in the household and, as we discuss below, economic theory suggests arguments for doing so, at least in respect of income from employment. Alesina et al. (2011) have termed this "gender-based taxation". However, in practice it is the norm to apply the same tax structure to the individual incomes, having the result that second earners will often, but not always, be paying lower marginal rates than primary earners,[6] to an extent dependent on the widths of the tax brackets and the amount of the earnings difference between the primary and second earners. However, couples with close to equal incomes will very probably be in the same bracket, in contrast to the case of gender-based taxation.

A second important characteristic of systems with individual incomes as the tax base is that the marginal tax rate of one earner in the household is independent of the income of the other. In the remainder of this paper we will refer to systems in which the tax base is individual income but the same rate schedule is applied to each earner as "individual taxation".

Although not in the majority, some of the economies in which the joint income of the two earners is taken as the tax base, in particular the USA, Germany and France, are among the world's largest. It is unnecessary to devote much space to define this system for a German reader. Its chief general characteristics are that by adding the couple's incomes, dividing them by a factor, most usually 2,[7] and then applying the tax schedule to the resulting income, the two earners pay the same marginal rate regardless of the size of the difference in their earnings, and an increase in the earnings of one person may raise the tax rate of the other. This latter effect is particularly strong in the German tax system, as opposed to the American, where an increment in the earnings of one person raises the tax rate of the other only if it shifts them into a higher tax bracket. Because, as mentioned above, the marginal tax rate

[6] The primary earner is designated simply as the person with the higher earned income. On average in the OECD countries around 80% of second earners are women.

[7] Of course there are differences in detail between countries, for example in France joint income is divided by a factor that depends also on the number of children, so-called family-splitting.

increases with joint income in the central two brackets of the German system, over this range any increase in one person's income necessarily increases the tax rate of the other.

A further important feature of joint tax systems is what is often called the "income-splitting advantage". A high income primary earner in a household in which the second earner has little or no income[8] will: (a) pay less tax than a household with the same primary earner income but with a second earner working a significant number of hours, and (b) the same amount of tax as a household with two lower-wage earners working full time to get the same total income. This property of joint taxation is very important when we come to evaluate the fairness in the way it allocates the burden of income taxation across households.

An important feature of the tax systems of the middle- and high-income countries of the world over the past few decades has been a significant reduction in the number of the tax brackets and a steady decrease in the marginal tax rates in the top bracket(s). A further important, world-wide phenomenon is that of "bracket creep", whereby the failure to adjust the bracket limits in line with inflation results in an increasing proportion of the taxed population moving into the higher tax brackets. Both these developments, which have taken place against the background of a significant increase in inequality of pre-tax wages and incomes in many of the major OECD countries, are relevant to the discussion of the relative merits of the different forms of tax system just outlined.

The above brief characterisations of the two tax systems reflect what economists perceive to be their main characteristics. The extent to which a tax system distorts incentives is usually referred to as the "efficiency effect" of the tax, and the way in which it determines the distribution of the tax burden across households and individuals is called its "equity effect". We now turn to an evaluation of the systems based on the two criteria of efficiency and equity in the allocation of the burden of raising a given tax revenue across households.

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[8] In the OECD countries, on average in roughly one-third of households there is only a single earner.

III. Evaluation

In this section we compare, from a theoretical point of view, the efficiency and equity effects of joint and individual taxation, and also discuss the issue of tax reform, the question of what happens to equity and efficiency when we move from a joint to an individual tax system, since this is the type of change that is possibly of most relevance to the German economy.

1. Efficiency

The superiority of a system based on individual rather than joint income on efficiency grounds is reasonably well-established, despite some attempts in the theoretical literature to overturn that conclusion.[9] The argument is based on a long-established principle of optimal taxation, the Ramsey Rule,[10] in conjunction with some robust empirical evidence.

The Ramsey Rule is based on the idea that the loss of wellbeing resulting from the imposition of a tax on a person's labour supply is greater, the larger the amount by which it is distorted away from the level it would be at in the absence of that tax. It follows that the greater the distortion a given tax rate would cause for a particular, identifiable category of workers, the lower should be the tax on that category. The following numerical example illustrates the logic of the Ramsey Rule.

Assume that in the absence of an income tax worker A, who has a wage of 25 euros per hour, would work 160 hours a month, and worker B, with a wage of 18 euros per hour, would work 80 hours a month. A key piece of information is the responsiveness of each worker's labour supply (hours worked) to a fall in the wage rate. Assume that every 1% fall in the wage causes a 0.1% fall in A's labour supply but a 0.5% fall in B's labour supply.[11] Let a tax of 30% be imposed on both workers, so that A's net

[9] For theoretical papers that seek to do this, unsuccessfully in my view, see Piggott and Whalley (1996), Meier and Reiner (2012), (2015), and Corneo (2013).
[10] So called because it was formulated by Frank Ramsey, the brilliant Cambridge mathematician and philosopher who made three fundamental contributions to economics, of which the Ramsey Rule is one, before dying at the tragically young age of 26. See Ramsey (1929).
[11] The values 0.1 and 0.5 are measures of the responsiveness of labour supply to changes in the wage, and are called the *elasticities* of labour supply.

wage falls to 17.50 euros and B's to 12.60 euros. In Table 1, we show the post-tax labour supplies, gross and net incomes and tax revenue.[12]

Table 1 about here

We assume that 1530 euros is the total tax revenue requirement. Because B's labour supply is much more responsive to changes in her (net) wage than A's, the reduction in her labour supply is much larger in both absolute and proportional terms.

In Table 2 we show the effects of differentiating the tax rates in the direction suggested by the Ramsey Rule, by imposing a lower tax of 15%, on B, and a higher tax of 34.5% on A, which allows us still to meet the tax revenue target of 1530 euros. We see that in comparison to Table 1, A's labour supply is slightly lower but B's is significantly higher, and the overall falls in aggregate labour supply and gross income are significantly lower.

Table 2 about here

An alternative way of looking at this example is to suppose that we begin with a system of joint taxation in which A is the primary earner in a "representative household" and B is the second earner. Both pay a marginal tax rate of 30%, A works full time and B part time. Now change the system to one of individual taxation, with the tax rates as assumed in the example, where this representative household pays the same tax in total. Then the example shows that both earners can be made better off, because the gain to the second earner outweighs the loss to the primary earner. Essentially, we are trading off the two distortions: a small increase in the distortion to A's labour supply and a large reduction in the distortion to that of B, with a gain to the household overall.

What gives this example its practical significance is the fact that the elasticity values of 0.1 and 0.5 reflect the range of empirical measurements of male and female labour supply elasticities respectively. In fact, the estimates of the labour supply elasticities of "prime age in-work males" vary from 0 to 0.1%, while those of females vary from 0.3% to more than 0.8%.

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[12] The figures in these tables have been quite drastically rounded, but without changing the lesson of the example.

When the example is translated to the economy as a whole, it suggests that the entire economy could be made better off by a move from joint to individual taxation, with no loss in tax revenue, because of the overall reduction in the distortion that the income tax system creates. Thus, the Ramsey Rule and the evidence on male and female labour supplies provide the main pillar of the argument that there are efficiency gains in replacing joint by individual taxation.[13]

However, an important fact, to add to the observation that female labour supply is much more sensitive to tax rates than that of men, is that whereas men, as primary earners, show a very high degree of uniformity in their labour supply - the large majority have full-time jobs and lifetime occupations or careers - female labour supply is much more heterogeneous, with, in the OECD countries, on average about one-third in full time work, one-third in part time work with wide variation in hours, and one-third not in the labour force.[14]

A sceptical reader may well therefore raise the objection: What happens in a household where there is only a single income, or a very low second income? Surely such a household will be made worse off, since the loss in primary earner's income may well not be compensated for by a gain in that of the second earner.

This point is both perfectly correct and important. Application of the Ramsey Rule only suggests that everyone in the economy *could* be made better off, but there may be losers as well as gainers if the tax reform is actually made. To take the argument further we need to clarify exactly who will be made worse off, and who better off, and also to discuss how society may judge the fairness of these changes. In other words, efficiency is only one part of the story, we also have to consider the question of equity. But before turning to this, we need also to consider some explanations for these important characteristics of household labour supply.

Why are there these differences in male and female wage elasticities and labour supply heterogeneity? In a standard economic model in which a worker's time is simply divided between "work" and "leisure" the answer has to be simply "tastes" or

[13] See Boskin and Sheshinski (1983) and Apps and Rees (1999) for details of the argument.
[14] There is however quite wide variation across countries, with the Scandinavian countries having much higher proportions in full time work, while in Germany and the Southern European countries these proportions are much lower.

"preferences". For some reason beyond the scope of the model to explain, women react more strongly than men to changes in their net of tax wage rates, and many women simply prefer to stay at home and "consume leisure" rather than go out to work

The idea that these important differences in male and female labour supplies and elasticities are simply due to tastes or preferences for leisure as opposed to work however is obviously unsatisfactory. Both theory and empirical work suggest more compelling reasons.[15] If we view the household not as a single individual but as a family, going through what we could call a "family life cycle", the differences in labour supply choices are due not to gender *per se* but to a basic difference in the roles the individuals play in the household. It is absurd to view all time not spent in paid work as "leisure".[16] Time-use studies show that time spent in producing goods and services for consumption within the household – above all child care, as well as the usual domestic chores such as cooking, cleaning, laundry, shopping and so on – is quantitatively more important (if we exclude sleeping) than time spent in "leisure activities", and moreover there is significant specialisation in production within households, with second earners spending much more time on it than primary earners.

It is this additional margin of substitution that second earners have, together with the fact that most of them are women, that is the primary underlying cause of the difference in male and female elasticities and in the heterogeneity of labour supplies across households.

It is useful to look at this more closely in terms of the "family life cycle", based not on the age of the head of the household, as is done in conventional economic studies, but rather in terms of phases through which a "typical" family goes.[17] When young people form a couple, they do not usually yet have children and are both fully employed. If and when they decide to have children, the situation typically changes

[15] For a more detailed discussion of these see Apps and Rees (2009). See also Alesina et al. (2011).
[16] To the non-economist, it may seem unnecessary to belabour this point, but unfortunately economic theory is still dominated by the idea of the simple division of time between work and leisure, and the habits of thought that this creates.
[17] There are of course important variations on the "typical family" described here, most importantly, if couples decide not to, or cannot, have children, and if they divorce or separate. For the discussion of family taxation however, it suffices to focus on the life cycle described here.

dramatically, with one partner, usually the female, in the majority of cases reducing her hours of work or dropping out of the labour force entirely, at least until the children start school. Following the phase when the children are quite young, there is still a high demand for household goods, but many women also take part-time jobs. When the children have grown up and (possibly) left home, the mother has far more time available, but if she has not remained in the labour force over the previous couple of decades she will find it hard to find a well-paid full time job. Finally comes retirement. It is this life cycle pattern that basically accounts for the difference between male and female elasticities and labour supply heterogeneity.

Within this basic pattern, there are of course additional important determinants of second earner labour supply choices. The phase in the household's life cycle when children are young is of central significance because the decisions taken then on the labour supply of the second earner will have very important and persistent effects on her labour market opportunities – in terms of both wage rates and job possibilities – later in the life cycle. Probably the two single most important economic factors[18] in the household's decision process in this vital phase are: the availability, quality and cost of non-parental child care; and the tax system.

The importance of the first factor has long been recognised in the comparison of female labour supplies in France and the Nordic countries, on the one hand, where high quality child care at subsidised prices is readily available, and in Germany and the Southern European countries, where such provision has historically been poor (at least in *West* Germany). This difference has been reflected not only in female labour force participation rates and proportions of women in full-time jobs, but also in fertility rates.

It might have been expected, or even hoped, by policy makers that low levels of female labour supply would be associated with larger family sizes, but that has not been the case. The correlation between female labour supply and completed fertility rates across the OECD countries is actually strongly positive, with Germany, Italy

[18] Other relevant factors are: social norms affecting attitudes toward working mothers and participation by fathers in child care and household work; and the availability of all-day schooling. Social norms are not however immutable, they do change over time. In the Anglo-Saxon countries for example attitudes towards working mothers have changed considerably since the 1960's.

and Spain having the lowest fertility rates and female labour supplies, and France and the Nordic countries having the highest. The problems this presents for the low-fertility economies, for example in terms of declining populations and the challenges presented by increasing age-dependency ratios,[19] seem to have now been recognised by policy-makers, at least in Germany, where the result has been a large expansion in pre-school child care provision.

However, as this particular obstacle to female labour supply diminishes in importance, so the problems presented by the joint tax system will become more apparent. Quite rationally, when a young couple is anticipating starting a family, they will consider the financial consequences, including those arising from the change in time allocations that will be required – who is going to look after the child(ren)? In general, because of the gender wage gap,[20] the loss of pre-tax income will be smaller if the female reduces her working hours than if the male does. Moreover, since her *net-of-tax* wage is generally lower under income-splitting than under individual taxation, because she is likely to be paying a higher marginal tax rate on her earnings in the former case, the argument for this is stronger under joint than under individual taxation. Then, for every hour she works the cost of bought-in child care acts as a further tax, which will typically be regarded as a subtraction from *her* earnings, since it would not be paid if she did not go out to work. And finally because, under the German system, the primary earner's marginal tax rate may very well fall as a result of the reduction in their joint income, this acts in effect as a subsidy to her reducing her labour supply. Once the children are present in the household, this calculation, done in reverse, provides a strong argument against it being worthwhile for her to increase her labour supply.

Under individual taxation on the other hand, not only will the gender wage gap be reduced, in after-tax terms, when the second earner's marginal tax rate is lower than that of the primary earner, but in addition his marginal tax rate is independent of whether she works or not. Thus the problem of combining family and career, though never easy, is less of a burden under individual than under joint taxation.

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[19] The ratio of the proportion of the population above retirement age to the proportion of working age.
[20] The difference between average male and female wages.

Moreover, it is not difficult to understand why this could actually increase fertility levels (provided appropriate child care possibilities exist). Typically, the levels of child benefit, either in the form of tax rebates per child or a straightforward cash transfer such as *Kindergeld*, are small compared to the full lifetime costs of raising children, and a second income, even after tax, can provide much higher levels of funding for larger families. Thus increasing female labour supply can present at least a partial solution to the problem of funding public expenditure in the face of increasing age-dependency ratios, not only by raising fertility levels but also by expanding the tax base.[21]

One can therefore argue that if society were faced with a choice between which of the two tax systems to implement *ab initio*, joint or individual taxation, their respective efficiency effects would very strongly favour the latter. The higher distortion caused by the higher tax rate on primary (mainly male) earners would be more than compensated for by the much lower distortion achieved by the lower tax rate on second (mostly female) workers.

However, as mentioned earlier, societies with existing joint tax systems are not facing a *tabula rasa*. There would have to be a tax reform, and it is easy to demonstrate that as a result of this, some households are likely to be made worse off by a change from joint to individual taxation, namely those in which under the current system the second earner works very few hours or none at all.[22] Such households will lose from the increase in primary earner tax rates and may gain little, if at all, from the reduction in second earner tax rates. Even if the economy as a whole gains overall, some people are worse off. Thus we must take into account the second set of effects of tax systems, those concerning distributional fairness or equity.

2. Equity

In 1990 the tax base for personal income taxation in the UK was changed from joint to individual income. The political pressure and support for this came not from economists arguing that this would bring about gains in economic efficiency, but

[21] For further discussion see Apps and Rees (2004).
[22] See Apps and Rees (1997), (1999), (2009).

rather from feminists and “women’s liberation” activists who viewed the existing joint taxation system as fundamentally unfair. Under it, a wife’s income was regarded in law as the property of the husband, she was his dependant, subject to his authority and power to take decisions on her behalf. This was criticised on the grounds that it limited her role in decision making, restricted her independence and worsened her position within the household. Thus, at that time, the argument for moving from joint to individual taxation was essentially one of achieving a greater degree of fairness and equality *within the household*.

The modern economic theories of decision making within households, which began to be developed in the 1980’s,[23] were consistent with this view. The degree of power or influence women would have in household decisions was viewed as depending on the strength of their “outside options”, as determined for example by their capacity to earn income, together with such factors as divorce laws and rules of division of marital property and child custody after separation, and also on their wage rates, own wealth and contribution to household income.[24] On the whole, relatively little attention was paid explicitly to the tax system, with the important exception of Apps (1981), (1982). Nevertheless, we would expect that a tax system that improved rather than inhibited the ability of women to combine career with family would be conducive to improving the position of women within the household, working through the factors just listed.

On the other hand, it must be kept in mind that the main function of the income tax system is to raise revenue to fund public expenditure, and there are limited possibilities in the design of its overall structure specifically to address the issue of the position of women, as second earners, within the household. For this purpose more specifically designed and targeted instruments are necessary.

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[23] See for example Apps, (1981), (1982), McElroy and Horney (1981), Manser and Brown (1980), and Apps and Rees (1988), though earlier forerunners were Samuelson (1956) and Becker (1965). For later developments see Konrad and Lommerud (1995), (2000) and Basu (2016). See Apps and Rees (2009) chs 2 and 3, for a fairly recent survey.

[24] The relative weights placed on these factors vary among the different theoretical frameworks. For example, early models based on Nash bargaining theory placed most weight on outside options or “divorce threat points”, while later models took a more general approach. Apps, (1981), (1982) emphasized work-related human capital formation. Work based on Becker’s early theories placed great emphasis on the “sex ratio”, the ratio between the number of marriageable men and women in the population at any given time.

For that reason, we would argue that, once we recognise the broad truth that individual taxation is superior to joint taxation in its effects on the position of women within the household, we should move on to place the emphasis, when comparing the equity effects of the two systems, on the issue of the distribution of wellbeing *across households*. Here, we have to recognise the importance of three empirical phenomena, two of which we have already discussed at some length: the importance of household production; the across-household heterogeneity in second-earner labour supply; and the degree of inequality in the primary earner wage distribution.

A strong intuition in support of joint taxation is that a household's wellbeing or standard of living is higher, the larger its total income from employment. This suggests that a move from joint to individual income as the tax base could have adverse equity effects because, in a tax system with marginal tax rates increasing in income, such a change can result in two households with the same aggregate income paying different amounts of tax, or even one with a higher joint income paying less tax, depending on the relative incomes of the primary and second earner. This would seem to violate the principles of both horizontal and vertical equity.[25]

However, it is not just money income that determines a household's real living standard. We also have to take into account the value of the goods and services produced and consumed within the household. Where these are produced primarily by the (potential) second earner using time that could alternatively be spent earning market income, this *untaxed* contribution to the household's living standard may actually vary inversely with its total money income.

We illustrate this with an example. In household A the primary earner has an income of 100,000 euros a year, and the (potential) second earner is not in the labour force. In household B the primary earner has an income of 60,000 euros a year and the second earner works full time for an annual income of 40,000 euros. Under simple income splitting the two households pay the same amount of tax.

Suppose alternatively there is an individual tax system with two brackets, a lower tax rate of 20% and a higher tax rate of 30% and the bracket limit, above which the

[25] *Horizontal equity*: individuals with equal living standards or capacities to pay should be taxed equally. *Vertical equity*: the higher one's living standard or ability to pay the higher should be one's tax burden.

higher rate is paid, is 58,000 euros. Then household A pays 24,200 euros and B pays 20,200 euros, which therefore appears to violate horizontal equity quite substantially. Moreover, we could vary the example by increasing one or both of the incomes in household B somewhat, so that it has a higher income than A, while still having it pay less tax, thus appearing to violate vertical equity.

These conclusions follow from taking total household income as a reliable measure of a household's wellbeing or capacity to pay. To argue this is however to assume that the domestic output of the (potential) second earner in household A, which may for example include a large amount of child care, is entirely valueless. At the same time, much of the income of household B may be spent on substitutes for these domestic goods, including child care, to replace the time not spent in household production by the second earner. When corrections are made for these factors, the level of wellbeing or living standard of household A may be at least as high as that of household B. The higher tax paid by household A may be viewed as implicitly correcting for the much higher value of *untaxed* household production that that household enjoys.

There is a further, so far unappreciated strand in the equity argument, which has become of increasing significance in the last few decades. This has been a period characterised by increasing wage and income inequality[26] and falling top tax rates[27] in the OECD countries. Now, in such an economy, under joint taxation the possibility of income splitting by high-income primary earners imposes a severe constraint on the extent to which the overall tax burden can be fairly allocated between households with very high standards of living on the one hand, and those that are in the low to middle ranges of the distribution of wellbeing on the other. Income-splitting could in fact be viewed as a means of tax avoidance:[28] having the second earner substitute household for market work is a perfectly legal means by which a high income primary earner can significantly reduce his tax bill. A recent theoretical paper[29] shows that

[26] See Atkinson (2015), Atkinson et al. (2011) and Piketty and Saez (2003).
[27] This very important development in the tax structures of high income countries is thoroughly documented in Peter et al. (2010).
[28] By tax *avoidance* we mean the use of some means to reduce one's tax burden in accordance with prevailing tax law. This is in contrast to tax *evasion*, where the means used are against the law.
[29] Apps and Rees (2016).

given the current high degree of inequality at the top of the primary income distribution, ending the advantage of income-splitting to high income households by moving from joint to individual taxation leads to a more progressive tax system in which overall equity gains actually reinforce the efficiency gains of the tax reform.

IV. Empirical Studies for Germany

The construction of theoretical models is very important for organising and clarifying thought and achieving important insights, but in the end cannot be an entirely conclusive argument for important and far-reaching tax reforms. Careful empirical analyses based on high quality data are also indispensable.

There have been a number of empirical analyses which quantify the consequences of changing the tax base in Germany, and which give overall support to the case for moving from joint to individual taxation. Noteworthy among the earlier studies are the well-known papers by Beblo et al. (2004), and Steiner and Wrohlich (2004), (2008). The short but important paper by Decoster and Haan (2011) presents a thorough analysis of the effects of switching from income splitting to individual taxation, and, using several alternative ways of representing society's evaluation of the gains and losses to different household types, confirms the superiority of individual taxation. Finally, in a paper that represents the cutting edge of current research in this area, Fehr and Ujhelyiova (2012) considers the switch from joint to individual taxation combined with a change in the child benefit system. Here I give only a brief summary of their results.

Higher direct or indirect transfers to families, such as would result from increases in *Kindergeld*, increase fertility but reduce female labour supply in the aggregate. Replacing joint by individual taxation in a tax revenue-neutral way increases female labour supply significantly but also reduces fertility. However, a joint increase in fertility and female labour supply is possible if the government provides increased child care facilities funded by the additional tax revenue resulting from replacing joint by individual taxation. All households receive significant gains in welfare, with low-skilled households benefitting more than high-skilled. This paper therefore confirms the results of the earlier German studies while significantly extending the depth and sophistication of the empirical analysis.

V. Conclusions

This paper has compared and evaluated the economic effects of basing the family income tax system on joint and individual incomes respectively. It assumes in the latter case that the same system of tax rates is applied separately to the incomes of primary and second earners, and so in that sense is based on earnings and not on gender. The characteristics of second earner labour supply that account for the gains in both efficiency and equity that would result from this reform are, we would argue, based not on gender but on the role that second earners play in the household.

The paper has emphasised that the relaxation of the high tax disincentives to second earner labour supply resulting from a move to individual taxation could make an important contribution to solving the problems posed by an ageing population, as long as it is accompanied by improvements in the availability of good quality child care. There are signs that this argument is receiving increasing recognition.

An important new argument that has been advanced here emphasises the equity gains from ending the income-splitting advantage to high income primary earners. This tax avoidance possibility places a severe constraint on the ability of the tax system to allocate the overall tax burden fairly across households, a constraint that has become more apparent in the light of the growth in income inequality that has taken place over the last few decades.

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Tables 1 and 2

Table 1: Effects of 30% Income Tax

	Post-tax wage	Post-tax hours	Net income	Tax paid	Gross income
A	17.50	155	2712	1163	3875
B	12.60	68	857	367	1224
Total		223	3570	1530	5100

Table 2: Effects of Differential Taxation

	Post-tax wage	Post-tax hours	Net income	Tax paid	Gross income
A	16.40	154	2532	1330	3862
B	15.30	74	1132	200	1332
Total		228	3664	1530	5194

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