Multiple Equilibria of Couple Specialization

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(word count = 8873)

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Abstract

We argue that a multiple equilibrium framework can help account for variations in couple specialization. The framework is dynamic, highlights the presence of competing normative regimes, and it helps empirical identification of Pareto optimal and non-optimal couple specialization. To compensate for the lack of longitudinal data, we analyse cross-sectional time use data for three countries that represent distinct stages in the ongoing gender revolution, namely Britain, Denmark and Spain. We identify a traditional, egalitarian and unstable family equilibrium and argue that inefficient and inequitable specialization is primarily associated with the lack of clear normative guidance within unstable equilibria. As in previous research, we find that a large proportion of couples specialize in ways that deviate from what rational choice theory would predict. Our equity analyses yield surprising results since we find more equity in Britain than in Denmark, and that widespread inequity within Danish couples is almost exclusively due to women being advantaged.

Introduction

The revolution of women's roles is associated with a huge leap in female education and employment. And yet, research consistently finds that women still account for the lion's share of domestic work (Bianchi et.al. , 2000; Greenstein, 2000; Gupta, 2007; Hook, 2006).

Some explain this as an instance of reproducing conventional sex identities; couples 'do gender' (Berk, 1985; Bittman et.al., 2003; Brines, 1994; Evertsson and Nermo, 2004; 2007). This suggests that couples sacrifice both efficiency and equity for the sake of reasserting identities. To illustrate, Brines (1994) finds that unemployed men tend to do exceptionally little housework. But some studies find that 'doing gender' may be more apparent than real – an artefact of illness, for example (Bianchi et.al., 2000; Gupta, 2007).

Greater economic independence should enhance women's bargaining power within marriage. And, yet, empirical research fails to uncover much of a bargaining effect (Breen and Cooke, 2995; Gupta, 2007; Shelton and John, 1996). Gupta (2007) argues that gender equality depends primarily on how much the woman earns in absolute rather than relative terms. From a game theoretical perspective, Breen and Cooke (2005) suggest that couple bargaining per se has little effect. Rather, the division of housework will become more egalitarian as the share of autonomous women forms a critical social mass, *conditional* on whether the share of male adjusters (i.e. men who adapt to women's new roles) is sufficiently large. Equality within any given couple depends, in other words, on societal level shifts. Bonke et.al. (2008) and Geist (2005) also emphasize macro-level effects in the form of gender egalitarian welfare state policies. As we shall see, Breen and Cooke's approach has strong affinities to the multiple equilibrium model we propose.

With regard to family life, we distinguish three equilibria: traditional strong specialization; a new gender-symmetric arrangement; and, finally, an 'unstable

equilibrium'. The latter is, strictly speaking, not an equilibrium since it lacks any commonly shared normative guidelines. It is likely to be associated with gender inequity and inefficiencies. We argue that 'doing gender' is one manifestation of unstable equilibria.

The emergence of multiple equilibria is the bi-product of the ongoing revolution of women's roles. This revolution has progressed very unevenly across the advanced nations. It may be nearing completion in Scandinavia (where the housewife has de facto ceased to exist), but is less advanced elsewhere, in Southern Europe especially (Esping-Andersen, 2009). Multiple equilibria reflect a dynamic (and accelerating) process of change. Ideally one would therefore want to capture associated behavioural change via longitudinal analyses. This is, unfortunately, precluded due to the lack of good panel data on time use. Our strategy is therefore to indirectly capture dynamics by comparing across three countries that are very differently positioned in terms of the female revolution, namely Denmark, Britain, and Spain.

A Multiple Equilibrium Approach to Family Behaviour

In economics, equilibrium refers to a situation in which individuals have well-defined expectations about others' strategies of action, and in which actual choices reflect preferences. Kreps (1990) portrays equilibrium behaviour as a 'self-evident way to play'. It is assumed to produce Pareto optimal outcomes. Any departure from equilibrium is likely to yield inefficient outcomes. As some economists recognize, the concept has strong affinities to sociological work on normative adherence (Manski, 1993; Lundberg and Pollak, 1996; Young and Burke, 2001). Some economists, in fact,

make this explicit in their modelling of individuals' behaviour (Durlauf, 2001; Brock and Durlauf, 2001; Blume and Durlauf, 2005). In other words, equilibria gain force to the extent that expectations are endogenously reaffirmed. This can be exemplified by the conventional 'Parsonian family'. It became an equlibrium because women invested primarily in homemaker skills in anticipation of their future role and this, of course, reproduced the self-fulfilling prophesy of comparative advantage.

The emergence of multiple equilibria depends, in the first instance, on exogenous triggers that then recast expectations. An alternative equilibrium will subsequently consolidate to the extent that the external shock is followed by a self-reinforcing endogenous process of adaptation – a novel 'self-evident way to play'. The logic is well illustrated in Krugman's (1991) theory of the industrial revolution. The revolution of women's roles can be interpreted along similar lines. It was initially triggered by exogenous factors, in particular birth control and new household technologies which, in turn, spurred women to invest in marketable skills (Goldin, 1990). As lifelong employment became a normative objective for women, the revolution fed on itself. In Scandinavia and North America, the revolution is maturing because it is normatively expected that any given woman will, indeed, prioritize economic independence. Where the revolution is less advanced, norms regarding the proper status of women remain far more ambiguous (Esping-Andersen, 2009). [1]

For hypothesis development there are two crucial attributes of multiple equilibria that need stressing. The first is the accelerating momentum of the endogenous dynamics (Fukao and Benabou, 1993). Initially, the move towards a new equilibrium will be

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[1] Azariadis (2008) stresses the indeterminancy of expectations in multiple equilibria.

hesitant. But as it gains normative acceptance it also builds up momentum, and actors will increasingly converge around the new way of doing things. The logic is very similar to the 'critical social-mass' effect that Breen and Cooke (2005) describe.

A second defining characteristic is the presence of an *unstable* equilibrium. It lacks any strong gravitational pull, and offers no clear signals to guide peoples' beliefs and choices. An unstable equilibrium is, by definition, not Pareto optimal and will therefore be associated with inefficiencies and inequities. One may think of it as a half-way house between a fading old equilibrium and an embryonic new one.

Family equilibria in advanced societies

In the wake of World War Two emerged what one might term a stable and modal *traditional family equilibrium*: the male as breadwinner and the female as home-maker; people married and had children quite young; fertility was high, and partnerships stable. In the pursuit of welfare maximization it would have seemed Pareto optimal to opt for a high degree of specialization given that the gender wage and education gap was generally huge.

The concluding decades of the 20th Century saw the emergence of a rival equilibrium, constructed around the dual career couple. Spearheaded by higher educated women, the revolution of women's roles eventually gained momentum and the housewife gradually disappeared.

As men's and women's market productivities converge, traditional gender specialization will appear sub-optimal. The opportunity costs in terms of foregone income will, for one, outweigh the gains. The rational response would therefore be to adopt a more gender symmetric arrangement.[2] Thus emerges the possibility of an alternative *egalitarian equilibrium.* To become stable, the endogenous process of self-fulfilling expectations needs to unfold.

What might such a new equilibrium look like? We must, firstly, be careful about the associated fundamentals. It does *not* generally include a renunciation of motherhood; the two-child norm remains basically intact as a preference -- albeit not necessarily in terms of behaviour. Indeed, the gap between desired and realized fertility in many countries may very well reflect the absence of any viable egalitarian equilibrium (Esping-Andersen, 2009). The new equilibrium will therefore most likely include children as a core component of the household production function. And couple specialization should become blurred as the partners' market productivities and labour supply begin to converge. In other words, the 'ideal type' family would be based on double-earner couples with children, and gender symmetry in the domestic sphere.

Specialization and Housework

Research shows that women continue to do the lion's share of domestic work, but it also identifies significant equalization over the recent decades (Bianchi et.al., 2000; Bittman et.al., 2003; Evertsson and Nermo, 2007; Hook, 2006). Indeed, when we compare data

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[2] Alternatively, as Sevilla-Sanz (2005) suggests, women may a priori decide against marriage if they conclude that a gender egalitarian division of labour is unrealistic to expect given the kind of marriage market available to them. From this it follows that marriage rates will decline in societies with persistent traditionalism regarding gender roles. Marriages should, however, recover as the new egalitarian equilibrium gains dominant status.

on housework over many decades we find a trend that very much supports the accelerating momentum-hypothesis. Men's share of housework – and of child care – remained surprisingly stable from the 1960s through the 1980s – a period that we might describe as the first stage of the female revolution. Beginning in the 1990s, however, we see rapid change – particularly in North America and in Scandinavia, where men's share of domestic work jumped by about 50 percent (Bianchi et.al., 2006; Bonke and Esping-Andersen, 2008; Gershuny et.al., 2005; Hook, 2006).

Yet, a significant segment of the population does remain loyal to traditionalism. We know from survey data that approximately 30 percent of American and Spanish women agree that the best kind of family is premised on a male breadwinner. The traditionalists are predictably much fewer (about 8 percent) in Denmark and Sweden (Esping-Andersen, 2009). [3] This does not imply, of course, that 92 percent of Scandinavians are now firmly ensconced in the egalitarian equilibrium. [4] It does, however, suggest that the traditional equilibrium is losing its normative sway; in Scandinavia, it commands hardly any compliance at all.

To give a notion as to how far a society has moved away from traditional specialization, we compare Denmark, Britain and Spain, utilizing the national time use surveys from, respectively, 2001, 2000, and 2003. [5] See Table 1.

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[3] Breen and Cooke's (2005: Table 3) data suggest that the proportion traditional women and 'hardliner' men is smaller in the US (12 and 23 percent, respectively). They arrive at identical rates for Scandinavia.
[4] In fact, Breen and Cooke's (2005) data identify about 30% of males who can be labelled as 'co-operator' in Sweden, and only 17% in the US.
[5] Note that we examine only couples (with and without children) where the head is aged 25-60 in order to avoid retirees and students. The advantage of these British, Danish and Spanish surveys is that they furnish time diary information for both members of the couple. Without such information, the empirical approach we pursue would not be viable. A major methodological weakness of most research is that it cannot connect directly the two partners' activities.

-- Table 1 here --

The three countries line up as anticipated. In Denmark, clearly, gender equality is approaching normative status; on average, men do 41 percent of all housework on workdays, and more than half of all couples exhibit an essentially egalitarian division of labour. [6] At the other extreme, Spain tilts decisively towards traditional specialization; more than a third of all men report zero contribution, and the majority less than 10%. Here we should remember that roughly 40 percent of our Spanish households are based exclusively on the male breadwinner.[7] Using the less restrictive 20%-cutoff, we discover that Britain, too, is predominantly traditional. These conclusions will have to be revised once we control for constraints. Many of the British zero-contributors, for example, turn out to have extraordinarily long work days.

These figures are, of course, no more than descriptive averages. Patterns of specialization differ markedly when, as we do below, one tests for equity and efficiency. Hence, couples that specialize more (or less) than their respective market productivities would warrant may be regarded inefficient in the sense that they could obtain superior welfare by embracing more (or less) equality.

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[6] In Denmark we find that in 30 percent of households, the male actually contributes in excess of 50 percent (in Britain, 19 percent and in Spain, 7 percent). These couples need, however, not be hyper-egalitarian since in many cases it turns out that the wife is ill or handicapped.   In order to define the space of basically egalitarian behaviour we follow Nock's (2001), namely that the husband's share falls between 40 and 60% of the partners' total housework time.

[7] Spain appears very traditional in respect of housework duties, but less so with regard to child care. Fathers, on average, contribute about 30 percent of total caring time. See also Gutierrez-Domenech (2007).

Decision Making in Couples

The emergence of equilibria will depend on how we make choices – in our case regarding couple specialization. Following Manski (1993), the choice of any person will, firstly, depend on individual attributes and preferences (e.g. Mary is adamant about her career); secondly on group membership and social context (Mary is member of a highly competitive sociology department); and, thirdly, on normative signals (serious sociologists are expected to publish a lot).

We assume that all individuals have the necessary information to develop similar beliefs. Under such conditions, individuals will seek to maximize their welfare on the basis of any given combination of individual returns and the benefits from normative compliance. If, for the moment, we ignore group membership, our choices depend on the relative *influence* of individual attributes, on one hand, and of social signals, on the other hand. The strength of social signals should influence how much any individual is likely to act in conformity with social norms. Their influence may depend on the intensity of social interaction, the degree to which there is social closure, or the fear of stigma.

Let us use P_i to represent the strength of personal incentives (for individual *i*), and $S_{i,j}$ to denote the strength of social signals for all persons *i* and *j*. So, if $S_{i,j} > 0$, an individual will have incentives to comply to prevailing norms. The higher the values of $S_{i,j}$ the more homogenous will group behaviour appear. If, in contrast, the social signals are weak ($S_{i,j} < 0$), then P_i will dominate and individuals will more likely act according to their own personal preferences. We need also to consider the probability distribution of

unobserved heterogeneity (γ). It is straightforward to theorize *binary* choice outcomes

on the basis of $S_{i,j}$, P_i , and γ.

When we assume that all $\varepsilon_i (c_i)$ are equal, the choice function, $m = \tan (\gamma P + \gamma S)$; it is a

continuous tangent function ranging from -1 to +1 (in the binary case). [8]Any choice

function (m) that fits this equation can emerge as a 'normative' equilibrium. A first

precondition for multiple equilibria is that some $S_{i,j}$ exerts a significant influence. For a

fixed S, the values of m need to be large. But m values will be small if a large share of

the population acts primarily on γ. Here, unobserved heterogeneity drives people's

behaviour and outcomes will largely reflect idiosynchratic choice. In such a situation

the sway of normative compliance is weak throughout the community, meaning that no

distinct equilibrium will emerge.

Multiple equilibria depend on the interaction of P_i and S. Different values of P will give

rise to multiple equilibria if $\gamma S > 1$ (remember that large values of S are a precondition

for equilibrium to begin with).This essentially means that people with different kinds of

P cluster around distinctly different normative epicentres (S). Recall that multiple

equilibria will include at least one unstable equilibrium. This means that $\gamma S > 1$, but

also that a sizable population is guided primarily by γP and that the values of m are

large.

As our subsequent empirical analyses suggest, the British case comes close to an

equilibrium-less scenario ($\gamma S = 0$). The traditional model of couple specialization has

lost its normative sway while no egalitarian alternative has emerged. In other words,

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[8] For a more detailed presentation, see Durlauf (2001). In regard to our particular study, binary choice situations would, for example, be between traditional or gender egalitarian arrangements. The tangent is the ratio of the length of, respectively, the opposite and adjacent side of an angle.

couple specialization in Britain appears to be patterned primarily by γP. Spain, in contrast, exhibits only one equilibrium. Traditional couple specialization remains the norm and, like in Britain, an egalitarian equilibrium does not yet exist. In Denmark, the traditional equilibrium has almost disappeared and a new, egalitarian equilibrium has become manifest, although far from hegemonic. In Denmark we also observe a substantial share of couples who appear primarily guided by γP which, combined with large values of m, suggests the presence of a large unstable equilibrium.

Empirical applications

The empirical analyses to follow serve partly the aim of identifying rival models of couple specialization, but also to shed new light on the question why the domestic division of labour remains so gendered. Although the data we use are strictly cross-sectional, our country comparisons are exploited to make tentative hypotheses regarding dynamics. It is important to stress that our analyses have no causal ambitions. The aim is to identify the traditional, egalitarian, and unstable equilibria in terms of the empirically estimated correspondence between partners' paid and unpaid work. We adopt the basic criterion that equilibrium behaviour is Paretian. This implies that observed specialization must be efficient and equitable (considering the partners' relative productivities). Unstable equilibrium membership is, in a sense, residually identified by the absence of Pareto optimal specialization.

For reasons of space, we must ignore possibly salient individual attributes (such as education) and group effects, such as social class membership. We can, nonetheless, address central sociological explanations of gendered behaviour. Our findings suggest

that 'doing gender' is especially prominent where the traditional equilibrium is in decay and has not yet been met by a credible egalitarian rival. We also show that doing gender is only one possible expression of inequity and inefficiency. We identify a non-trivial minority of men who contribute more to housework than would be expected.

We can now formulate empirical predictions about family outcomes in a multiple equilibrium setting. The conditions for Pareto optimal outcomes in the Traditional Equilibrium are well known to anyone familiar with Becker's (1991) writings. He assumed a unitary utility function (the altruistic dictator) that spouses will seek to maximize under the budget constraint. The principal components of the utility function are family consumption (including leisure), number and quality of the children.

Any of these components – as well as the core assumption of a unitary function – would be logical candidates for equilibrium identification. To begin with, one would logically expect that partners' preferences are more likely to be at odds in a context where social norms fail to provide strong guidance. If a couple values children, any deviation from the desired number or quality will indicate Pareto non-optimality. Very low fertility levels are, together with divorce, perhaps the most visible signals of an unstable equilibrium, which is also what Feyrer et.al. (2008) and Gershuny et.al.(2005) implicitly suggest. [9] If the couple values consumption it will, again, arrive at a non-optimal outcome if a different kind of spousal specialization would have produced more income or leisure. To the extent that unstable equilibria are associated with indeterminancy and volatility, one would expect that family arrangements may change radically when faced

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[9] Brodman et.al. (2007) and Cooke (2009) suggest that fertility among career women may be related to the degree to which the father contributes actively in home production. The decision to marry may also be related to the same logic. As Edin and Kefalas (2007: 307) argue, poor women in the US refrain from marriage "not because they think too little of it, but because they revere it". They are, in our framework, in an unstable equilibrium that fails to produce optimal partnering outcomes.

with 'shocks'. This is captured very well in a few studies of couple dynamics (Grunau et.al., 2008; Gupta, 1999). Grunau et.al. (op.cit) show that egalitarian couples often revert to conventional specialization after the arrival of a child.

Identifying Specialization

We focus on a somewhat narrow concept of housework rather than, more broadly, all unpaid domestic tasks. This is motivated by several considerations. Firstly, some domestic activities, child care in particular, are desirable – what Juster (1985) calls process benefits. [10] In contrast, housework is generally considered as undesirable. Secondly, and for essentially the same reason, we exclude gardening and do-it-yourself-work since these are often hobbies.

Within a standard Becker framework, efficient specialization should mirror spousal differences in labour market productivity. Following Ermisch (2003) and Pollak (2005), market productivities are best captured by hourly wages. We must of course recognize that decisions regarding all tasks, including also child care, hours worked in the market, and leisure, are made simultaneously. Furthermore, how these tasks are allocated will in reality not simply reflect productivities, but will also be driven by preferences (the husband loves to cook), constraints (the presence of many children, illness, or very long working hours and commutes), or by the ability to externalize tasks (a cleaning lady).

We measure the degree of specialization (H_c) as the ratio of the male's housework hours over the couples' total sum of housework hours. Within this framework, we

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[10] Halberg and Klevmarken (2003) show that taking care of children ranks at the very top among desirable activities.

operationalize optimal specialization in terms of symmetry between H_c, on one hand,

and the ratio of the male's paid working hours (controlling for hourly wages) over the

couple's total paid hours, on the other hand. In our empirical applications we shall

include adjustments for the hours' differences that the spouses dedicate to child care, the

differences in spousal leisure time, and the hours equivalent of external help.

Given this 'symmetry-approach', efficient specialization will fall on, or close to, a

perfect declining diagonal slope of 45degrees with regard to paid working hours,

adjusting for child care and external help. Deviations are bound to exist considering the

real daily travails within families (he arrives late because he was caught in a traffic jam;

she had to visit her sick mother). In order to allow for such, we define all households

that fall within a (+/-) .10 deviation from the .45 diagonal, as Pareto efficient. [11] We

term this the *'Becker Optimum Space'*. Inefficient households will accordingly be those

that are located above or below the Becker Optimum Space. See Figure 1 for a graphical

rendition of family equilibria and the Becker Optimum Space.

-- Figure 1 here --

The symmetry that we impose can be questioned if people derive different levels of

welfare from paid work and housework. Empirically, this is difficult to address since the

data sets we analyze do not furnish detailed information on activity enjoyment.

Moreover, there is bound to exist substantial welfare heterogeneity within both kinds of

activities (most people prefer to cook rather than clean; some jobs are more pleasurable

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[11] The decision to estimate with a .10 deviation is essentially arbitrary. It corresponds, however, to a ½ standard deviation for the British case. The OLS estimated ½ standard deviations for Denmark and Spain were, respectively, .05 and .07. Initially we adopted a one standard deviation, but it yielded a span that appears way too wide. To illustrate, for Britain a one standard deviation would imply efficiency in all cases where the husband's contribution lies between 16 to 54 percent.

than others). Our 'symmetry-approach' should yield an acceptable degree of validity if we can assume that the welfare distributions are fairly similar within the two kinds of activities.

We identify three modal specialization scenarios:

1) *Under-shooting*. In this scenario H_c < Becker optimum space, i.e. the husband's contribution to housework falls below the predicted ratio. This may capture 'doing gender', but can also be due to objective constraints (the husband is ill).

2) *Over-shooting*. Now H_c > Becker optimum space, i.e. the husband does 'too much'. In this case we may be identifying hyper-egalitarian couples or, again, objective constraints (the wife is ill).

3) *Efficient specialization* occurs when H_c falls within the Becker optimum space.

But, as discussed earlier, observed deviations from the optimum space need not indicate 'true' inefficiency if they are caused by theoretically non-trivial circumstances, such as preferences or objective constraints. Our data allows us to identify important constraints but, as noted, information on preferences is inadequate.

Our analyses provide, we believe, the first ever attempt to correct also for leisure inequities. This is important if under- and over-shooting also represent a partner's effort to rectify inequities. The male would be justified in doing less housework if the wife, net of all work, enjoys far more leisure time than him. Vice versa, he may be

overshooting because he enjoys a leisure advantage. In such cases the couple is latently efficient. The 'doing gender' thesis would only be valid for couples where under-shooting has no justification.[12] We therefore include also a separate test for leisure equity.

Methodology and data

Since the basic properties of multiple equilibria are dynamic, we ideally need longitudinal studies that include independent time use information for both members of the couple. Unfortunately, such data do not exist. There exist a few longitudinal data sets, such as those employed by Evertsson and Nermo (2007) or Gronau et.al. (2008), but they do not provide the required time use information. One partner's reported hours for the spouse are known to be unreliable (Shelton and John, 1996). In fact, most studies that address the 'doing gender' thesis are, to our knowledge, based either on surveys with no time diaries whatsoever, or on data with diary information for only one partner.

Our empirical analyses are based on the Danish 2001, the Spanish 2003, and the British 2000 time use surveys. These were chosen so as to maximize data quality because they all furnish individual time use diaries for both partners. [13] Additionally, these countries represent very well the different stages in the unfolding revolution of women's roles.

For estimation purposes, we restrict the original samples. We include only households consisting of couples (with or without children) where both adults are between 25 and

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[12] Those studies that explicitly control for time constraints and/or for the presence of health problems tend to find little support for the doing-gender thesis (Bianchi et.al., 2000; Davis and Greenstein, 2004).

[13] The United States could not, for these reasons, be included in our analyses. Detailed information on national time use surveys can be obtained from the IATUR, the International Association for Time Use Research, based at Oxford University.

60 years of age (so as to exclude retirees and students). To avoid censored cases, we exclude all those who report that the given day was 'unusual'. We also exclude all households that reported no housework on the observation day. Finally, we omit cases with incomplete time diaries or where information on key variables (such as health status and earnings) is missing. This leaves us with 834 couples for Denmark, 1875 for Spain, and 895 for Britain. [14]

From our examination of distributions of housework time we found, in all three countries, a non-trivial number of extreme outliers. In order to neutralize their effect and to ensure more efficient estimation we therefore prefer statistical identification on the basis of regression-predicted values.

Our key dependent variable, H_c, measures (in minutes) the husband's housework divided by the sum of the couple's housework time. We include all standard tasks such as cleaning, washing, preparing food, ironing, etc. as well as shopping for food and basic household organizational activities. But we exclude gardening and do-it-yourself activities and also housework done for other households than one's own. For Denmark and Spain we must exclude shopping since it is impossible to differentiate between types of shopping. We include housework both when it is reported as the primary and secondary activity.

We begin by OLS estimation of the core model: $E(H_c) = \alpha + \beta X + \Sigma H_{h,w} + \varepsilon$, where X measures partner differences in relative productivities (i.e. log wage rates) and the basic components of the household production function, namely the number of children, the

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[14] We have tested whether the omission of cases with inadequate information introduces bias. Comparing non-responders to the rest we find that the former are statistically significantly different in terms of hours of paid and unpaid work. But, fortunately, the effect is generally very small (3-4 percentage points).

presence of a pre-school aged child (yes/no), outside help (yes/no), and (log) non-wage household income. [15] The model also includes the sum of total housework hours. [16] We can then identify the proportion households where men are, respectively, over- and under-shooters and, of course, those that fall within the Becker optimum space.

In a second step we examine whether observed specialization is influenced by the presence of constraints or by internal equity adjustments. As noted earlier, we must ignore the role of preferences for lack of information. Analyses (not shown) for Britain show that housework-related preferences, such as loving to cook, have no significant explanatory value whatsoever. [17]

Empirically we focus on the two faces of inefficiency, the under- and over-shooter couples. To capture constraints, we use information on the partners' health status (the respondent reports health problems that limit normal functioning on the reporting day, measured with a dummy variable) and on the length of their work day (a dummy for whether the respondent spends more than 12 hours in paid work, including commuting time). Additionally, we use weekend data to examine whether the under-shooters compensate when constraints are relaxed. [18]And to capture equity adjustments, we examine whether under- and over-shooting is a function of differentials in the partners' availability of leisure time. Following Aguiar and Hurst (2006) this is the residual

[15] OLS should be the most efficient estimator considering that we have no censoring problem due to the exclusion of all cases that reported that the interview day was unusual.

[16] Due to its centrality in the budget constraint, it is standard practice to include also (log) non-wage income (for most families it will primarily consist of welfare state transfers). This we do for Denmark and Spain, but the British data do not permit its estimation. In the case of Spain it turns out that the variable has no effect whatsoever, but in Denmark it is important.

[17] A fourth theoretically relevant factor would be connected to intra-household income and consumption transfers. The husband may have very strong preferences for a new car, the cost of which however would necessitate a curtailment of the wife's (and family's) consumption. In this case, a Pareto optimum could be restored if the husband over-shoots on housework. The time-use data do not permit such estimation.

[18] Weekend estimation is not possible for Spain because the survey sampled different households for week days and weekends.

discretionary time net of paid work, housework, and child care. It therefore also includes sleep and 'personal' time. We adopt the criterion that a meaningful leisure differential must be of minimally one hour.

Partners who compensate due to constraints or equity imbalances may be potentially efficient. From logit regressions (not shown) for, respectively, the over- and under-shooters, we found that health, work hours, and leisure inequity all have significant, non-trivial effects.

Results [19]

In Table 2 we present results from the first stage of estimation – i.e. without correcting for constraints and equity adjustments. In Table 3, we also control for constraints and leisure-time imbalances that may account for why men over- or under-shoot. To take into account such 'excuses', Table 3 includes a category of *proto-efficient* specialization to describe those cases of over- and under-shooting that can be ascribed to constraints and equity adjustments.

-- Tables 2 and 3 here --

The distributions we find are quite consistent with theoretical predictions. Let us begin with the unadjusted estimates in Table 2. In Spain, clearly, traditional specialization dominates and this yields a substantial degree of efficiency. In fact, we find that 70% of

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[19] Due to the sheer volume of regression output that underpins the tables to follow, we choose to present only the synthetic results. Readers who wish to consult the full set of original estimations can obtain them at: XXXXXXXXXX

those who report zero male housework are located within the Becker optimum space simply because they are pure male breadwinner couples. In Denmark, in contrast, we find considerable gender symmetry. Britain is an intermediate case in which 'undershooting' (and, possibly, 'doing gender') is especially pervasive. But note that 'doing gender' coincides with substantial 'undoing gender' (the over-shooters).

Closer scrutiny reveals that traditional male breadwinner couples are more likely to be efficient than are dual earners in Spain (31% compared to 8%) and in the UK (52% compared to 25%). In Denmark it is the other way around: 26% of the (very few) male breadwinner couples are efficient compared to 40% among dual earners. [20]

The patterns change drastically when we take into account constraints and equity adjustments, shown in Table 3. We now find far lower rates of over- and, especially, under-shooting. The share of 'genuine' Danish under-shooters is now 21%, in Britain 55%, and in Spain, 46%. Most of this decline can be attributed to men's overly long workdays and to leisure time inequities.[21] In Spain, the under-shooters decline only modestly – in most cases (60%) it is because the wife enjoys a leisure advantage. Our findings suggest that equity adjustments are commonplace in the everyday-life of families. On any given day, 7 percent of British (and 10 percent of Spanish) men are 'excused' from doing more housework for reasons of equity.

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[20] Male breadwinner couples are defined as those where the husband accounts for more than 80% of total working hours (in the large majority of cases, he is the sole breadwinner). Dual earner couples are those where both partners' labour supply falls within the 40-60 percent range.

[21] It turns out that the majority (63% in Britain) of zero-reporting men have an 'excuse' – in most cases because they are the sole breadwinner. This suggests that the hard-core cases of doing gender in Britain are limited to about 10 percent of all couples.

Over-shooting is not necessarily an act of 'undoing gender'. A fourth of the Danish, a third of the British, and half of the Spanish cases disappear when we adjust for the wife being ill or the husband enjoying more leisure time; there are virtually no cases where he over-shoots because the wife works long hours. Likewise, the vast majority of over-shooting men work on a full-time basis. But even after adjustments, the phenomenon of 'undoing gender' is not trivial and needs, accordingly, to be dealt with more seriously in the literature.

Easing time constraints

On weekdays citizens encounter constraints that we cannot observe in our data. We therefore add one more test by examining weekend behaviour, focusing especially on our genuinely over- and under-shooting males (from Table 3): do they compensate by doing, respectively, less and more when constraints are lifted? This test can, unfortunately, not be applied to Spain since the survey sampled different people on weekends. We adopt the same approach as before but include a dummy variable for whether the spouses do some paid work (one hour +) during the weekend. To better identify how much compensation occurs, we estimate with two versions of the dependent variable: E (H_c), as before, and the total minutes of male dedication.

The results suggest that compensatory behaviour is common. The housework share of Danish genuine under-shooters increases by 15% and the British by 3%. In terms of actual hours of housework we discover, additionally, that the under-shooters end up dedicating more time than the average male (6% more in Denmark; 10% more in

Britain). Likewise, in Britain the over-shooting men do less on weekends (their share decreases by 5 percentage points). The Danish over-shooters, however, show no change at all. We estimated the same model for the genuinely efficient couples (in Table 3) but find no weekend effects whatsoever. This suggests that the symmetries we observed for working days obtain also on weekends.

However, when we use *actual* reported (rather than predicted) values we find no compensatory behaviour whatsoever among over- and under-shooters. Since predicted values neutralize the impact of extreme outliers, it is tempting to conclude that the under- and over-shooter groups are internally bi-modal, including some who compensate and some who do not. In the British case, for example, we find that 10% of the under-shooters do no housework (nor child care) during weekends, but also that 13% do more than 60 percent of the total.

Similarly to Brines (1994) we also examined couples where he is jobless and she works. In Denmark, the number of cases is too small for statistical estimation. Our British results (not shown) do confirm the argument, since in such couples men dedicate 33 percent less time to housework than would be expected. This said, it needs to be stressed that the phenomenon is quite rare. Globally speaking, it represents 2 percent of all British households, and only 7 percent of all cases of under-shooting.

Equilibria Estimates

We can now turn to the identification of multiple equilibria. A first condition for equilibrium membership is whether or not a household is situated within the Becker

efficiency space. Equilibrium membership will, secondly, depend on the predicted

relative labour supply of the spouses, obtained by regressing the male's share of total

paid hours in the couple $(E\ P_c) = (p_h/p_h + p_w)$ on the same model as previously. The

equilibria are then identified by the cross-distributions of $[E\ (H_c)]$ and $[E\ (P_c)]$ – as

depicted in Figure 1.

The rationale for now focusing on (predicted) labour supply is that any equilibrium

condition must require symmetry between paid- and housework. It has the additional

advantage of addressing the conventional finding that men's labour supply is inelastic

with respect to household tasks (Blundell and MaCurdy, 1999). Hence, it allows us to

capture, albeit indirectly, whether men adhere to, or break with, traditional behaviour.

We adopt the following criteria:

1. *The egalitarian equilibrium* refers to households where $E\ (H_c)$ falls within the

    Becker optimum space *and* where $E\ (P_c)$ falls between .40 and .60.

2. *The traditional equilibrium* refers to households where $E\ (H_c)$ falls within the

    Becker optimum space *and* where $E\ (P_c) > .80$.

3. *The proto-traditionalists.* In this case $E\ (P_c) > .80$ *and* the couple belongs to the

    proto-efficient group identified in Table 3.

4. *The proto-egalitarians.* In this case $E\ (P_c)$ falls between .40 and .60 *and* the

    couple belongs to the proto-efficient group identified in Table 3.

5. *The unstable equilibrium.* All non-proto efficient households that fall outside the

    Becker efficiency space.[22]

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[22] There remain a number of households that belong to neither equilibrium although they fall within the
Becker efficiency space (2 percent in Spain; 14 percent in Denmark and 5 percent in the UK). They are

As before, we first identify unadjusted equilibrium distributions and then obtain

adjusted values by correcting for constraints and equity adjustments. See Table 4 for

unadjusted, and Table 5 for corrected estimates. Graphical representations of the

distributions in Table 5 are shown in Appendix Figures 1-3.

-- Tables 4 and 5 here --

Our estimates bring out strong country contrasts. In Denmark, the traditional

equilibrium has virtually disappeared, and this is the only country with any significant

egalitarian equilibrium. Representing 26 or, at the most, 38% (including the proto-

egalitarians from Table 5) of households it is clearly not hegemonic. The unstable

equilibrium is fairly large (41% after adjustments). Specialization in Danish couples

combines, in other words, strong gender egalitarianism with a substantial degree of flux:

strong values of S coincide with substantial γP. If the accelerating-momentum

hypothesis is correct, we should expect a substantial shift towards the egalitarian

equilibrium in the years to come.

In Britain, the traditional equilibrium has no doubt lost its normative force considering

that it represents only 15 (with the proto-traditionalists, 17) percent of couples. But no

genuine egalitarian equilibrium has managed to assert itself. Here we observe weak

values of S and an over-dominance of γP – in other words, very little clustering and no

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primarily couples where the wife works short part-time hours. In this study they are treated as 'residual'
cases. The rows in Tables 4 and 5 will therefore not sum to 100 percent. For future research, it would
clearly be of interest to examine cases with non-standard working hours more explicitly.

normative pull from any clear direction. The incidence of sub-optimal specialization is large.

Spain emerges as the polar opposite of Denmark, still dominated by a traditional equilibrium that represents half of the population. And, like in Britain, the egalitarian equilibrium simply does not exist. All told, Spain does not conform to the basic characteristics of multiple equilibria. It exhibits very strong S as far as traditional norms are concerned, but low values of m (basically = 1), and substantial γP, considering widespread sub-optimal specialization. In Spain, traditional family norms have not yet met with any credible challenge.

These differences align quite closely to the stage that the female revolution has reached in the same three countries. Our comparisons may, therefore, be capturing indirectly the dynamic properties of multiple equilibria.

Testing for Equity

Fairness, as distinct from egalitarianism, is a prerequisite for Pareto optimality. Our data permit only equity identification via time allocation at one point in time. We opt therefore for a simple test, namely whether the partners end up diverging significantly in their command of discretionary 'leisure' time, net of the sum total of their paid and unpaid work. As before, we adopt the decision rule that inequity exists if one partner enjoys at least a one hour leisure advantage over the other. And to avoid double-counting, we ignore the equity adjustments that entered into the estimations in the previous section.

Table 6 presents the percent equitable couples within each group identified in Table 5. As before, we present predicted values. Now the tables seem to have turned. With the exception of Britain, equity is the exception rather than the norm. Considering that gender symmetry is far more common in Denmark, it is quite puzzling that Danish couples manifest so much inequity. It turns out that the lion's share of inequity is found among couples where women enjoy a substantial leisure advantage. This is evident in Denmark and also in Spain where, overall, women are the winners in 90%, respectively 83%, of all inequity cases. The distribution is more gender balanced in Britain where women are advantaged in 56% of all inequitable cases. In Denmark, the women are advantaged within all equilibria, but in Britain and Spain we find clear bi-modality: a large female advantage (70% in Britain and a staggering 97% in Spain) in the traditional equilibrium, while men gain the upper hand in the unstable equilibrium (67% and 58%, respectively).

Once we recognize the female advantage, it is not difficult to identify the logic that drives these seemingly puzzling results. The huge female advantage in the British and Spanish traditional equilibrium reflects, to begin with, conventional specialization. Time-saving technologies (and fewer children) have made housework far less time consuming. It is also likely that commuting adds to the male's total working time. The male advantage in the British and the Spanish unstable equilibrium is found primarily among couples where both spouses are employed and, in the majority of cases, where males under-shoot. As Table 6 suggests, the incidence of equity is surprisingly high among such couples, greater indeed than in any other equilibrium. This directly contradicts one of our initial hypotheses, namely that stable equilibria should exhibit not

only efficiency but also equity. We would, in contrast, have expected pervasive inefficiency and inequity in the unstable equilibrium.

The answer to this puzzle may lie in multiple equilibrium dynamics, namely the initially cautious shifts that then gain accelerating momentum. Consider first the finding that, in Denmark, women are the winners throughout. Had we instead analyzed Danish data from the 1980s, we would have found the exact opposite pattern, namely widespread inequity that favoured husbands. As noted earlier, Danish men were initially reluctant to adjust to the changing role of women, but then adjustment occurred very rapidly: men's contribution to both housework and child care doubled in the 1990s.

This suggests the hypothesis that, as the female revolution progresses, men's *total* workload may increase more than women's. As we have seen, the average Danish male now does about 40% of all housework despite the fact that his average workday is typically longer than the wife's (and that the wife is more likely to be on leave). On average, the Danish female enjoys a 1.4 hour leisure advantage over her partner.

In contrast where, as in Britain and especially Spain, women's employment is more limited and men usually work longer hours, the end result is more likely to appear equitable – even when the wife does the majority of housework. And the male 'equity advantage' that we also identified within both the British and Spanish unstable equilibrium may, then, represent the early, slow-moving stage of multiple equilibrium formation – men have not yet begun to adapt fully to women's new roles.

These results cast new light on the longstanding debate on gender equalization. The 'doing gender' approach focuses on gender inequality without questioning whether observed behaviour is actually equitable. Hochchild's (1986) 'double shift' concept does address fairness and her notion would have been valid for Denmark in the 1980s. But, ironically, today it applies more to Danish men. Put differently, the double shift and doing gender are probably not manifestations of a stalled revolution. It is far more likely that such practices gain ground during the early phases of a normative transformation. The Danish case illustrates how radically the normative framework can change once it gains momentum.

We can now pull it all together and identify the incidence of Pareto optimal specialization. To qualify, a couple must, by definition, belong to our genuine equilibria. We find, rather predictably, only a small proportion of truly Pareto-optimal couples: 20% in Denmark, 18% in Britain, and only 10% in Spain. But as one would expect, in Denmark they cluster heavily in the egalitarian equilibrium (a third of all) whereas in Britain and Spain they cluster in the traditional equilibrium (a third, respectively half, of all). The large proportion of Pareto optimal couples in the 'female part-timer' group suggests that future research might fruitfully explore these kinds of couples from a multiple equilibrium perspective.

Conclusions

Examining family life from a multiple equilibrium perspective provides, we believe, a fruitful sociological insight into contemporary behaviour. The standard linear view (more or less equality) that has dominated sociological research on couple specialization

may fail to capture gender relations correctly. This is so because it ignores the possibility that families cluster according to different normative logics.

Numerous studies claim to uphold the 'doing gender' thesis. Apart from the fact that such studies frequently rely on weak data, their conclusions may also be spurious. Our findings are consistent with those of Bianchi et.al. (2000) and Gupta (2007): when we control for time constraints, we do not find any pervasive doing gender effects. We introduced an added 'equity adjustment' that, as far as we know, has never been applied before. We discovered that a substantial amount of under-shooting could be justified for equity reasons. We also uncovered a non-trivial degree of over-shooting – which, however, does not necessarily represent 'undoing gender' behaviour.

Our study suggests that doing gender needs to be identified in terms of potentially competing normative equilibria. Within this framework we do identify practices that conform to the doing gender concept, but their role seems quite marginal within the overall context. Couples are not doing gender simply because they adhere to the traditional equilibrium.

Also, the latent dynamics that our nation comparison helps capture suggest that we need to revise our sociological approach to gender relations. This is particularly evident in the equity analyses. Firstly, the conventional view that men fail to compensate as women embrace paid employment seems true only for the first stages of normative transformation. Here Gershuny's (2005) notion of lagged-adaptation appears indeed to be valid. Secondly, the Danish data suggest that as gender symmetry gains normative

strength men begin to adapt rapidly. The pervasive female equity-advantage in Denmark suggests, in fact, that Danish men may be over-adapting.

Our main findings give little comfort to those who adhere to the assumption of perfect rationality. The share of genuinely efficient couples is everywhere less than half of the total population. But if we include also the proto-efficient cases, we arrive at a rational division of labour equal to 55% of British households, 64% of the Spanish, and 66% of the Danish. These country contrasts are particularly interesting because they may tap, once again, the multiple equilibrium dynamics. Efficiency is far more pronounced in Spain and Denmark but, of course, for opposite reasons: in Spain, because the conventional male breadwinner family still remains pervasive; in Denmark, because the gender-symmetric model is well-entrenched. In other words, the kinds of inefficiencies that we associate with the unstable equilibrium are most manifest in societies, just like the British, where the old normative order is in decay and where an alternative has yet to become established. Since under-shooting accounts for most of the inefficient cases, this is another way of saying that 'doing gender' is very much a reflection of a normative order in flux. Still, the substantial presence of proto-efficient British couples may signal the emergence of the accelerating self-reinforcing shift towards an egalitarian equilibrium. Were we to make predictions, we would expect to find an accelerating decline of 'doing gender' in Denmark whereas, in Spain, we would expect it to increase.

This raises two interesting empirical question. Firstly, what might be the threshold that sets in motion the accelerating endogenous process of self-reinforcing expectations that will, as its end result, produce a new, firmly entrenched equilibrium? Put differently,

when will the egalitarian equilibrium begin to attain hegemonic status? Secondly, who are the pioneers and laggards in the process of equilibrium change? Considering what we know from existing research, we would expect education to be highly salient. What may be the effect of changing marital choice, homogamy in particular? To arrive at answers we clearly need longitudinal data.

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Figure 1. A Graphical Representation of Family Equilibria and the Becker Optimum Space (between solid diagonal lines).
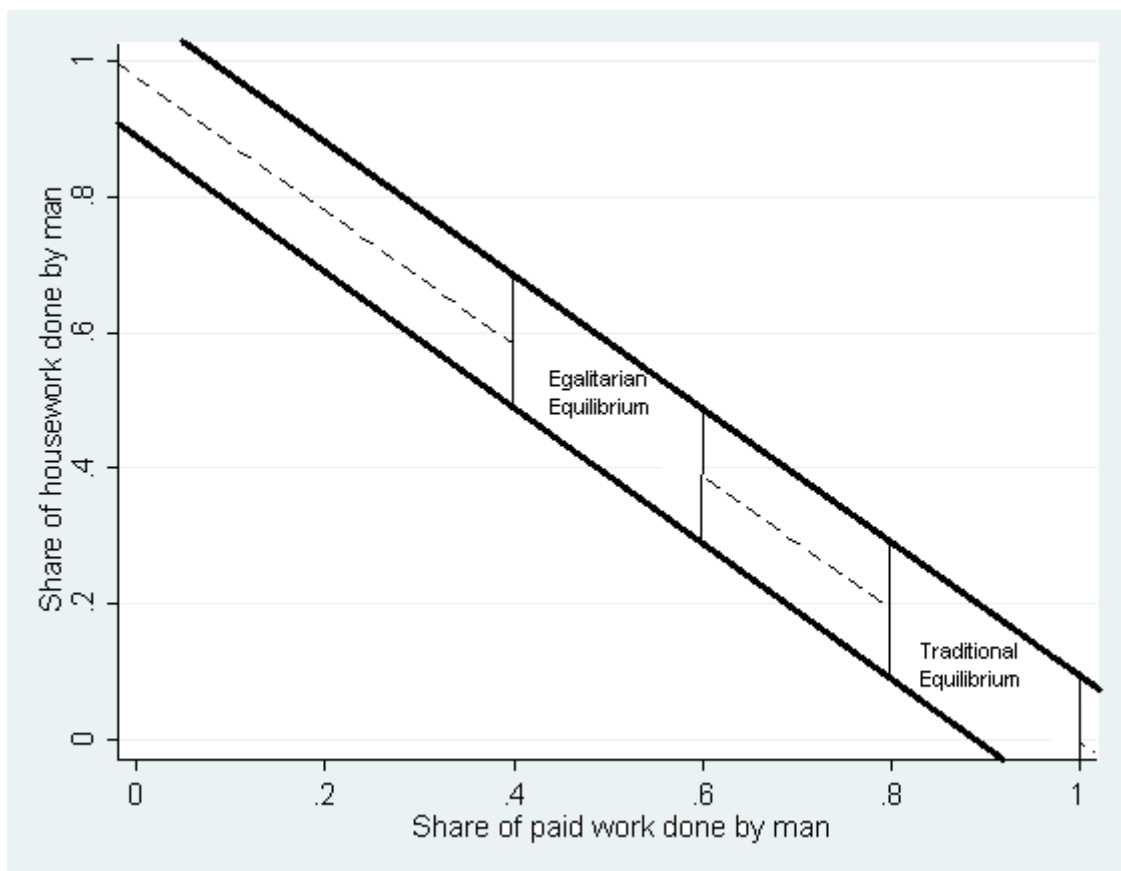
Table 1. Men's Share of total Housework in Couples (Working days)

	Mean (%)	He = zero	He < 10%	He < 20%	He 40%-plus
Denmark	41	12	20	31	55
Britain	26	22	35	51	27
Spain	16	38	55	71	12

Sources: Danish 2001 Time Use Survey (N=922); Spanish 2003 Time Use Survey (N=1875); British 2000 Time Use Survey (N=895).

Table 2. Deviations of Housework Specialization from the Becker Optimum Space. Predicted values for Working Days.

	% efficient Un-adjusted	% He overshoots unadjusted	% He undershoots unadjusted
Denmark	42	17	41
Britain	22	14	64
Spain	42	8	50

Table 3. Deviations of Housework Specialization from the Becker Optimum Space. Predicted values for Working Days, adjusting for constraints and equity adjustments

	% Genuinely efficient	% Proto-efficient	% Genuine Over-shooters	% Genuine Under-shooters
Denmark	42	24	13	21
Britain	22	13	9	55
Spain	42	9	3	46

Table 4. Pre-adjusted equilibrium distributions (percentages). [*)]

	Households in traditional equilibrium	Households in egalitarian equilibrium	Households in unstable equilibrium
	unadjusted	unadjusted	unadjusted
Denmark	1	26	59
Britain	15	0	63
Spain	49	0	44

[*)] The rows do not sum to 100 because there are couples that satisfy the efficiency criterion but do not belong to any of the defined equilibria (14% in Denmark; 22% in Britain; and 7% in Spain)

Table 5. Adjusted equilibrium distributions (percentages).

	Genuine traditional equilibrium	Proto-Traditional	Genuine egalitarian equilibrium	Proto egalitarian	Genuine Unstable equilibrium
Denmark	1	4	26	12	41
Britain	15	2	0	2	60
Spain	49	0	0	0	43

**Table 6. The incidence of equity by equilibrium membership. *)**

	All couples	Genuine traditional equilibrium	Proto-traditional	Genuine egalitarian equilibrium	Proto-egalitarian	Genuine unstable equilibrium
Denmark	27	--	--	26	8	28
Britain	57	42	12	--	--	63
Spain	38	11	--	--	--	64

*) – refers to cases with too few observations for estimation purposes.

Appendix Figure 1. Denmark: The Distribution of E(H$_c$) and E (P$_c$) around the Becker Optimum. Adjusted values.
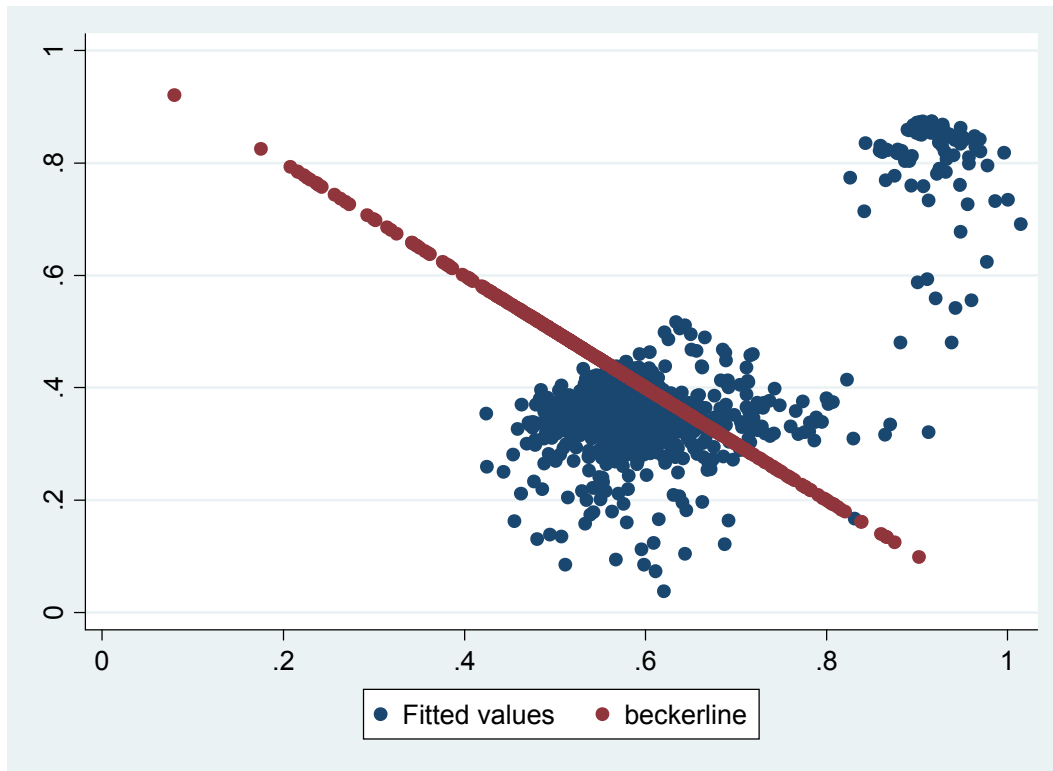
Appendix Figure 2. Britain: The Distribution of $E(S_c)$ and $E(P_c)$ around the Becker Optimum. Adjusted values.
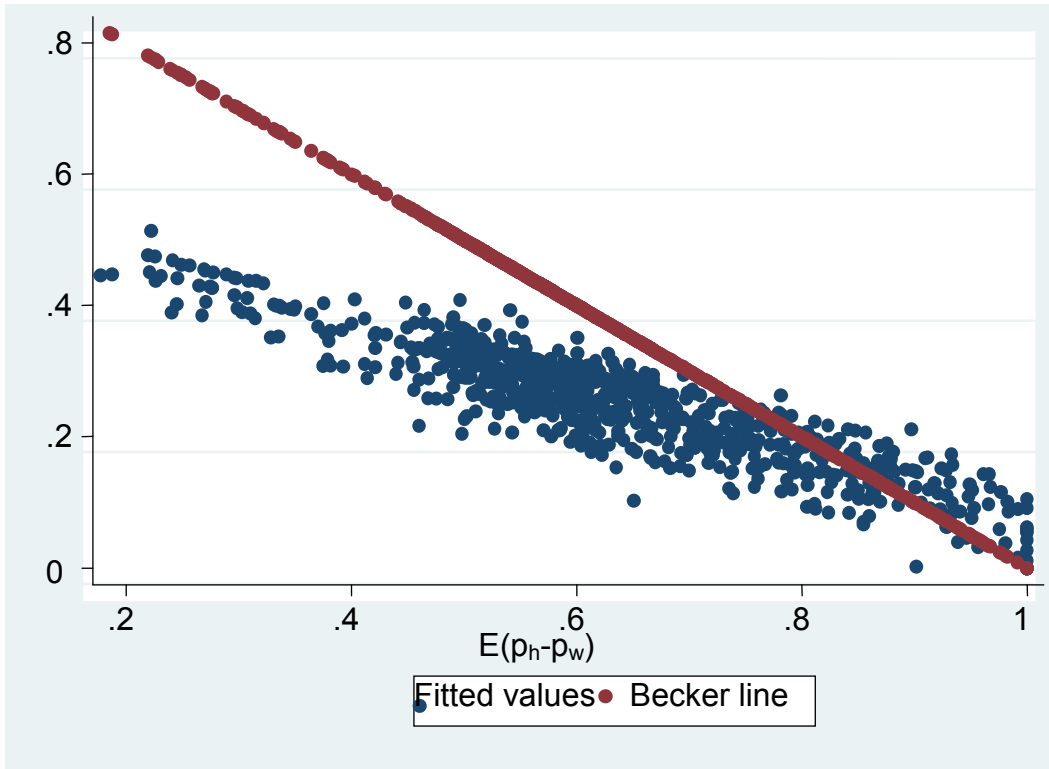
Appendix Figure 3. Spain: The Distribution of $E(S_c)$ and $E(P_c)$ around the Becker Optimum. Adjusted values.