

Cigno, Alessandro; Komura, Mizuki; Luporini, Annalisa

Working Paper

Self-Enforcing Family Rules, Marriage and the (Non)Neutrality of Public Intervention

CESifo Working Paper, No. 5948

Provided in Cooperation with:

Ifo Institute – Leibniz Institute for Economic Research at the University of Munich

Suggested Citation: Cigno, Alessandro; Komura, Mizuki; Luporini, Annalisa (2016) : Self-Enforcing Family Rules, Marriage and the (Non)Neutrality of Public Intervention, CESifo Working Paper, No. 5948, Center for Economic Studies and ifo Institute (CESifo), Munich

This Version is available at:

<https://hdl.handle.net/10419/144983>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



Self-Enforcing Family Rules, Marriage and the (Non)Neutrality of Public Intervention

Alessandro Cigno
Mizuki Komura
Annalisa Luporini

CESIFO WORKING PAPER NO. 5948

CATEGORY 5: ECONOMICS OF EDUCATION

JUNE 2016

Presented at CESifo Area Conference on Applied Microeconomics, March 2016

An electronic version of the paper may be downloaded

- from the SSRN website: www.SSRN.com
- from the RePEc website: www.RePEc.org
- from the CESifo website: www.CESifo-group.org/wp

ISSN 2364-1428

CESifo

Center for Economic Studies & Ifo Institute

Self-Enforcing Family Rules, Marriage and the (Non)Neutrality of Public Intervention

Abstract

We demonstrate that the notion of a “family constitution” (self-enforcing, renegotiation-proof family norm) requiring adults to provide attention for elderly parents carries over from a world where sexually indifferentiated individuals reproduce by cell separation, to one where individuals differentiated by sex marry, have children and bargain over the allocation of domestic resources on condition that individual preferences are transmitted from parents to children, and having the same preferences is a criterion for marrying. We also show that policies are generally nonneutral (even if the individuals concerned are altruistically linked to one another) and affect the share of the adult population that are governed by family constitutions.

JEL-Codes: D100, I200, I300, J100.

Keywords: marriage, family constitution, preference transmission, policy neutrality.

Alessandro Cigno
Department of Economics and Management
University of Florence / Italy
cigno@unifi.it

Mizuki Komura
Faculty of Economics
Musashi University / Tokyo / Japan
mizuki.komura@gmail.com

Annalisa Luporini
Department of Economics and
Management
University of Florence / Italy
annalisa.luporini@unifi.it

Revised version of the paper presented to the CESifo Applied Microeconomics Conference, Munich 18-19 March, 2016. Comments by conference participants are gratefully acknowledged.

1 Introduction

Bernheim and Bagwell (1988) argue that, if everybody were altruistically linked to everybody else by blood or marriage, any public action, no matter whether distortionary or non-distortionary, would be neutralized by private reaction. As government policy is plainly nonneutral in practice, the same authors take their result as a symptom that private actions affecting the wellbeing of others cannot be entirely explained by altruism. Indeed, Altonji et al. (1992) find that micro-data reject the altruism hypothesis. A possible explanation of this finding is that altruism does not rule out free-riding. For example, an adult may derive utility from an elderly parent's consumption, and yet be happier if this consumption is paid for by others. Bernheim et al. (1985), Bruce and Waldman (1990), Zhang and Zhang (1995), Cremer and Pestieau (1996), Chiappori and Weiss (2007), Pezzin et al. (2009) and several others introduce elements of strategic self-interest in altruistic models. Others, like Cremer and Roeder (2017), do away with altruism altogether. But none of these authors addresses the neutrality question.

Another possible reason why policies are nonneutral in practice could be that individual optimization is constrained not only by the law of the land, but also by family or societal norms. Empirical economists take these extra-legal norms as exogenously given, and account for them by controlling for marital status, religion, ethnic group and the like. Some theoretical economists have attempted to endogenize them. In particular, Cigno (1993) demonstrates that a family norm ordering adult family members to support their young children and elderly parents yields a subgame-perfect Cournot-Nash equilibrium under fairly unrestrictive conditions. A family governed by such a norm operates like a pay-as-you-go public pension system where current workers pay for the pensions of past workers, and will in turn have their pensions paid by future workers. Caillaud and Cohen (2000) show that the same applies to society-level norms. Cigno (2006) further demonstrates that, again under fairly bland conditions, a family norm is renegotiation-proof, and may thus be regarded as the family-level equivalent of the political constitution that restricts a parliament's legislative powers (in particular, its power to pass legislation detrimental to future generations).¹

The basic family constitution model has been extended by Rosati (1996) to accommodate uncertainty, by Cigno and Rosati (2000) to account for imperfect substitutability between market (or government-

¹Self-enforceability and renegotiation-proofness are not needed at the national level, where making sure that a piece of legislation conforms with the country's constitution is the job of a constitutional or high court, and constitutional amendments require a qualified majority or confirmation by referendum.

provided) services and the personal services of one's near and dear, by Anderberg and Balestrino (2003) to explain non-altruistic investment in children's education, by Cigno (2006) to allow for descending altruism, and by Chang and Zijun (2015) to explain bequest rules. Thus extended, the model appears to be consistent with the available data.² Like purely altruistic models, "constitutional" models with or without altruism assume rationality. In the former, however, individuals respond rationally to a given economic and legal environment. In the latter, by contrast, individuals respond rationally to a norm that is itself a collectively rational response to the environment. Constitutions bear similarities also, but are not to be confused with relational contracts.³ The latter are in fact negotiated by the interested parties, and differ from legally enforceable contracts only in that they require mutual trust (because they concern actions or outcomes that can be observed but not verified). The former, by contrast, come about at the instance of a person, couple or generation, and remain in place long after their initiators are gone, because it is not in their successors' interest to disobey or amend them. Put more formally, relational contracts belong in repeated games where the players are always the same, while constitutions arise in repeated games where the players change at each round.

A limitation of the family constitution models developed to this date is that they abstract from sex differentiation, sexual reproduction and marriage. What if individuals divide into men and women, and a woman will normally team-up with ("marry") a man to have a child?⁴ Whose family rules will apply then, his, hers or both? The problem does not arise in traditional societies where a party (usually the woman, but in some cases possibly the man)⁵ "marries into" the other party's family, and becomes automatically subject to the rules governing it. It does arise, however, in modern societies where both parties retain (or do not retain, as the case may be) their links with their families of origin. The present paper extends the basic constitutional model to take account of these complications, and addresses the question whether family constitutions exist (not necessarily for all families, and not necessarily the same for each of them) and affect policy outcomes. It also enquires

²For descriptive evidence, see Crimmins and Ingegneri (1990), and Cigno and Rosati (2000). For macro-econometric evidence, see Cigno and Rosati (1992, 1996, 1997), and Cigno et al. (2003a). For micro-econometric evidence, see Cigno et al. (2006), and Galasso et al. (2009). For a survey of the evidence, see Arrondel and Masson (2006).

³See Bull (1987), MacLeod and Malcomson (1989), and Levin (2003).

⁴We are aware that medical developments have made this unnecessary.

⁵For example, in Japan at least until the Meiji revolution, and in India still today, if the bride's family has no male heirs, her parents may effectively adopt the groom.

whether a policy can affect the share of constitution-abiding couples in the adult population. We demonstrate that family constitutions exist for some preference parameter configurations on condition that (a) having the same preferences is a criterion for marriage, and (b) preferences are imprinted or inculcated by parents into children. We also argue that it is in the interest of individuals who had such preferences imprinted or inculcated to do the same to their children. We finally show that policies are generally nonneutral even if the interested parties are altruistically linked, and that they affect the share of constitution-abiding couples in the adult population.

2 Assumptions

There is a large number of persons of both sexes. Each of them lives three periods, labelled $p = 0, 1, 2$. A person is an infant in period 0, an adult in period 1, old in period 2. Adults can work and marry. Infants and the old can do neither of these things. People derive utility from their consumption of market goods in periods 1, 2 and 3, and from any personal attention they might receive from their parents in period 0, and from their children in period 2. As we are primarily concerned with developed societies, where adults have ample opportunities to make material provision for old age via the market or the public pension system, we assume that the old are not interested in receiving money from their grown-up children. They are interested in receiving their children's attention, however, because that type of service has no perfect market or government-provided substitute.⁶ If parents are altruistic towards their children, they derive utility also from giving their children attention, material goods and education, and from making them bequests. They do not derive utility from giving money or attention to their own parents, or to their spouses. This last assumption ("descending altruism") is somewhat extreme, but nothing of substance changes if we allow for the possibility that adults derive utility also from making presents to their parents ("ascending altruism") or to their spouses, as long as this does not yield as much utility as making presents to children. As a consequence of these assumption, the old will receive attention only if it is in their children's interest to provide it.

Unmarried individuals do not have children. If a person chooses to remain single, her or his utility is given by

$$U = \beta \ln c_0 + \phi \ln g + c_1 + \ln c_2, \quad 0 < (\beta, \phi) < 1,$$

⁶Evidence that what the elderly receive from their grown-up children in developed countries is primarily personal services is reported by, among others, Crimmins and Ingegneri (1990), and Cigno and Rosati (2000).

where c_p is this person's consumption of market goods in period $p = 0, 1, 2$, and g is the amount of parental attention he or she receives in period 0. Given that this person's decisions are taken in period 1, when c_0 and g are bygones, the budget constraints are

$$c_1 + s = w$$

and

$$c_2 = sr,$$

where s is the amount she or he saves in period 1, w is her or his wage rate, and r is the interest factor. Given that capitalized savings are this person's only source of period-2 consumption, s will be chosen strictly positive. The pay-off of remaining single is

$$R = \max_s (w - s + \ln sr) = w - 1 + \ln r.$$

If a couple is formed ("marries"), they have a daughter, denoted by D , and a son, denoted by S .⁷ Couples are sorted by their preferences, and by their maximized utility as singles (their outside option).⁸ Take the couple formed by a particular woman f , and a particular man m . The assumption that they have the same R implies that they have also the same w as in Lam (1988), and Peters and Siow (2002).

When they decided to marry, f and m knew their own, but not their children's wage rates.⁹ We assume that k 's wage rate will be high, w^H , with probability π_k , and low, w^L , with probability $1 - \pi_k$, where

$$\pi_k = \pi(z_k), \quad \pi'(z_k) > 0, \quad \pi''(z_k) < 0, \quad \pi(0) = 0,$$

and z_k is the amount of education that f and m give $k = D, S$ in period 1 of their lives. The expected utility of $i = f, m$ is given by

$$\begin{aligned} EU_i = & c_{0i} + \phi \ln g_i + c_{1i} + \ln c_{2i} \\ & + \delta \{ \pi(z) (\ln \beta t_D^H + \ln \beta t_S^H) + [1 - \pi(z)] (\ln \beta t_D^L + \ln \beta t_S^L) \} \\ & + \alpha (EW_D + EW_S), \quad 0 \leq \alpha < 1, \quad 0 < (\phi, \delta) < 1, \quad \ln \beta \delta > 1, \end{aligned}$$

⁷This is a simple way of ensuring the balance of the sexes. Assuming instead that the probability of a female birth is the same as the probability of a male birth would unnecessarily complicate the analysis.

⁸As we are going to model the couple as a Nash-bargaining game, these two assumptions ensure that the game will be balanced. A justification for the first of these assumptions, namely that individuals bent on marriage look out for like-minded partners, will emerge from the analysis.

⁹The latter is the only source of uncertainty. Following Ben-Porath (1980), we assume that asymmetric information is not a major problem where closely related individuals are concerned, and may be disregarded.

where t_k^J , $J = H, L$, is the amount of attention that i may¹⁰ receive from k in period 2 if the latter's wage rate turns out to be w^J , α is a measure of parental altruism, and

$$EW_k = \phi \ln g_k + \ln b_k + \pi(z_k) \ln w^H + [1 - \pi(z_k)] \ln w^L$$

where g_k is the amount of attention, and b_k the bequest, that k receives from f and m if α is positive.¹¹ The restriction on $\ln \beta \delta$ ensures that the benefit of t_i even if the latter is less than one. Notice that EW_k has the nature of a local public good. Notice also that the pleasure i gets from giving z units of education to k comes from the fact that this will improve k 's earnings and marriage prospects. Both c_{0k} and g_k are measured starting from the subsistence minimum, which is normalized to zero. To simplify, we assume that infants receive only the subsistence amount of consumption, and that c_{0k} is consequently zero.

In general, g_k , z_k and b_k could be provided by either or both parents. Given our focus on sex differentiation, however, we assume that g_k is provided entirely by f .¹² We also assume that f pays for z_k and m for b_k , but this does not entail any further loss of generality, because we allow for the possibility that f will receive a compensatory payment T (positive, negative or zero) from m in period 1.¹³ As a further simplification, we assume that parents do not have gender preferences, so that $g_k = g$, $z_k = z$, $b_k = b$ and $EW_k = EW$. The budget constraints facing f are then

$$c_{1f} + s_f + 2z = (1 - 2t_f - 2g)w + T$$

and

$$c_{2f} = r s_m.$$

Those facing m are

$$c_{1m} + s_m + T = (1 - 2t_m)w$$

¹⁰May rather than will because, as already noted, it may not be in k 's interest to provide this service.

¹¹As EW_k is not obtained maximizing k 's utility conditional on (c_{0k}, g_k, b_k, z_k) , the model is characterized by "impure" altruism in the sense of Andreoni (1990).

¹²For a marriage model that allows for the allocation of family duties to be negotiated between the spouses, see Cigno (2014).

¹³Like most of the economics of marriage literature, we take it for granted that neither party can commit to compensate the other in period 2, because the transactions cost of negotiating a legally enforceable contract is taken to be prohibitively high. Any compensatory payment by one partner to the other must thus be made in period 1. In contrast with this literature, however, Cigno (2012, 2014) shows that a spouse may be able to commit even in the absence of a legally enforceable contract if divorce courts tend to compensate the disadvantaged party.

and

$$c_{2m} + 2b = rs_m.$$

As in a long series of contributions starting with Manser and Brown (1980), we posit that the choice of (g, z, b, T) conditional on marriage is Nash-bargained between f and m . The pay-off of marriage will depend on whether a family constitution is or is not in place.

3 Marriage in the absence of a family constitution

According to our assumptions, an old person will not get her children's attention as a present. She could buy it off them. Given that the good does not have a perfect market substitute, however, the children would be able form a cartel, and set the price so high that the entire surplus generated by the transaction will go to them. Bernheim et al. (1985) argue that, as an alternative to paying cash, a parent could commit to bequeathing her entire fortune either to the child who has given her the most attention or, if that attention falls below a certain minimum, to a third party. According to this argument, the surplus would go to the parent, rather than to the children. Cigno (1991) remarks, however, that the children could counter the parent's strategy by drawing-up a perfectly legal contract committing only one of them to give the parent the minimum amount of attention required to inherit the lot, and share the inheritance (minus a specified amount as compensation for the attention given to the parents) equally with the others.¹⁴ That would give the entire surplus back to the children. In the present section, we assume that adults do not give attention to their elderly parents,

$$t_i = t_k^J = 0.$$

In the next section, we will investigate the possible existence of alternative means of securing filial attention.

Under present assumptions, the couple will marry if and only if the pay-off is at least as large as R for both parties. If a Nash-bargaining equilibrium exists, it will then maximize

$$N = (EV_f - R)(EV_m - R), \quad (1)$$

where

$$EV_f = w(1 - 2g) - 2z - s_f + T + \ln(rs_f) + 2\alpha EW, \quad (2)$$

¹⁴Other possible objections to Bernheim et al. (1985) are that (a) it may be difficult for the parents to commit to assigning the estate in the way described because testaments can be re-written at the last minute, and (b) certain legislations prescribe that at least a certain share of the estate has to go to the children.

$$EV_m = w - s_m - T + \ln(rs_m - 2b) + 2\alpha EW, \quad 0 \leq \alpha < 1, \quad (3)$$

and

$$EW = \phi \ln g + \ln b + \pi(z) \ln w^H + [1 - \pi(z)] \ln w^L. \quad (4)$$

Notice that EV_i differs from EU_i in that it does not include i 's period-0 utility (a by-gone in period 1, when the bargaining takes place).

If α is positive, marriage expands the utility-possibility set because it generates an otherwise unattainable local public good, $2EW$. Therefore, a Nash-bargaining equilibrium conditional on marriage exists (i.e., the (R, R) point lies inside the utility-possibility frontier), and the couple will consequently marry. We show in the Appendix that the Nash-bargaining equilibrium is

$$\hat{g} = \frac{2\alpha\phi}{w} \quad (5)$$

$$\hat{b} = 2\alpha r \quad (6)$$

$$\hat{s}_f = 1 \quad (7)$$

$$\hat{s}_m = 1 + 4\alpha \quad (8)$$

$$\hat{T} = \hat{z} - 2\alpha(1 - \phi) \quad (9)$$

$$\pi'(\hat{z}) = \frac{1}{2\alpha\Delta \ln w} \quad (10)$$

where

$$\Delta \ln w \equiv \ln w^H - \ln w^L. \quad (11)$$

Notice that $\hat{g}$ is decreasing in its opportunity-cost (the mother's wage rate), and that $\hat{z}$ is increasing in the children's high to low wage ratio. The compensatory payment $\hat{T}$ is so determined, that

$$(EV_f - R) = (EV_m - R),$$

and thus that

$$EV_i = E\hat{V},$$

where

$$E\hat{V} = w - 2\alpha(1 + \phi) - \hat{z} - 1 + \ln r + 2\alpha E\hat{W}. \quad (12)$$

and

$$E\hat{W} = \phi \ln \frac{2\alpha\phi}{w} + \ln 2\alpha r + \pi(\hat{z}) \ln w^H + [1 - \pi(\hat{z})] \ln w^L \quad (13)$$

If α is zero, f and m are indifferent between marrying and staying single (i.e., the (R, R) point lies on the utility-possibility frontier). If they do marry,

$$\hat{g} = \hat{b} = \hat{z} = \hat{T} = 0 \text{ and } \hat{s}_f = \hat{s}_m = 1.$$

4 Marriage in the presence of a family constitution

We now investigate the possible existence of a family constitution requiring every adult female F (male M) to give a certain amount of attention t_F^J (t_M^J) to each of her (his) elderly parents, conditional on the giver's realized wage rate being w^J , $J = H, L$, and on the receiver having done the same for her or his own parents a period earlier.¹⁵ We go about this task in three steps. First, we characterize the Nash-bargaining equilibrium of the (f, m) couple conditional on the constitution. When the bargaining takes place, the couple's common wage rate w is known, and the amount f and m must give each of their respective parents is consequently known too. What is not known yet is the amount they will receive from D and S , because that will depend on the realization of D 's and S 's wage rates. Second, we look for a pair of functions, $t_F(\cdot)$ and $t_M(\cdot)$, such that the Nash-bargaining equilibrium associated with

$$t_f = t_F(w), t_m = t_M(w), t_D^J = t_F(w_F^J), t_S^J = t_M(w_M^J) \quad (14)$$

is not Pareto-dominated by any of the equilibria associated with different $t_F(\cdot)$ and $t_M(\cdot)$. If this equilibrium exists, (14) is renegotiation-proof in the sense of Bernheim and Ray (1989), and Maskin and Farrell (1989),¹⁶ and may thus be regarded as a family constitution. Third, we check that the equilibrium in question exists.

Our first step is then to maximize

$$N = \left(EV_f - E\hat{V} \right) \left(EU_m - E\hat{V} \right), \quad (15)$$

where

$$\begin{aligned} EV_f &= [w(1 - 2g - 2t_f) - 2z - s_f + T] + \ln(rs_f) \\ &\quad + \delta \{ \pi(z) (\ln \beta t_F^H + \ln \beta t_M^H) + [1 - \pi(z)] (\ln \beta t_F^L + \ln \beta t_M^L) \} \\ &\quad + 2\alpha EW, \end{aligned} \quad (16)$$

¹⁵In Cigno (1993, 2006a), the rule concerns material support rather attention, and a necessary condition for the rule to be obeyed is that the pay-off is at least as high as that of buying assets. This restriction does not apply here, because filial attention can neither be bought nor substituted with money.

¹⁶As already pointed out, asymmetric information is not a major problem where members of the same family are concerned. The same cannot be assumed in other contexts, however, for example in a business relation. For a definition of renegotiation-proofness in the presence of asymmetric information, see, among others, Dewatripont (1989), Aghion et al. (1990), Dewatripont and Maskin (1990), and Neeman and Pavlov (2013).

$$\begin{aligned}
EV_m &= [w(1 - 2t_M) - s_m - T] + \ln(rs_m - 2b) \\
&+ \delta \{ \pi(z) (\ln \beta t_F^H + \ln \beta t_M^H) + [1 - \pi(z)] (\ln \beta t_F^L + \ln \beta t_M^L) \} \\
&+ 2\alpha EW
\end{aligned} \tag{17}$$

and EW is still determined by (4).

In the last section, we established that, if α is positive, marriage will give f and m access to an otherwise unavailable local public good, $2EW$, and will thus expand the utility-possibility set. Would the existence of a family constitution further expand that set? Not necessarily, because a constitution will give the couple access to a pair of otherwise unavailable private contingent goods, t_D^I and t_S^J , but it will also oblige i to give $2t_i$ to her or his parents. Given that

$$E\widehat{V} \geq R,$$

we cannot then be sure that the game will have a solution (i.e., that the $(E\widehat{V}, E\widehat{V})$ point will lie on or inside the utility-possibility frontier), and thus that a constitution exists. We show in the Appendix that, if the optimization has a solution, the Nash-bargaining equilibrium conditional on (14) is

$$g = \frac{2\alpha\phi}{w} \tag{18}$$

$$b = 2\alpha r \tag{19}$$

$$s_f = 1 \tag{20}$$

$$s_m = 1 + 4\alpha \tag{21}$$

$$T = w(t_f - t_m) + z^C - 2\alpha(1 - \phi) \tag{22}$$

$$\pi'(z) = \frac{1}{2\alpha\Delta \ln w + \delta\Delta \ln t} \tag{23}$$

where

$$\Delta \ln t \equiv (\ln t_F^H + \ln t_M^H) - (\ln t_F^L + \ln t_M^L). \tag{24}$$

T is so determined that

$$(EV_f - E\widehat{V}) = (EV_m - E\widehat{V}),$$

and consequently that

$$EV_f = EV_m.$$

Our second step is to find functions $t_F(\cdot)$ and $t_M(\cdot)$, such that the norm is renegotiation-proof. As the norm is supposed to apply not only

to the (f, m) couple, but also to f 's and m 's respective parents, the z chosen by the latter will be the same as the one chosen by the former. Given that this norm will have been formulated *before* f 's and m 's common wage rate w is revealed (indeed before f and m are even born), we then maximize the expectation of EV over w^J , $J = H, L$,

$$\begin{aligned} E(EV) = & \pi(z) w^H + [1 - \pi(z)] w^L - 2\alpha(1 + \phi) - z - 1 + \ln r \\ & - 2 \left\{ \pi(z) w^H t_F^H - [1 - \pi(z)] w^L t_F^L \right\} \\ & + \left\{ \pi(z) w^H (t_F^H - t_M^H) - [1 - \pi(z)] w^L (t_F^L - t_M^L) \right\} \\ & + \delta \left\{ \pi(z) (\ln \beta t_F^H + \ln \beta t_M^H) + [1 - \pi(z)] (\ln \beta t_F^L + \ln \beta t_M^L) \right\} \\ & + 2\alpha \left\{ \phi \ln \frac{2\alpha\phi}{w} + \ln 2\alpha r + \pi(z) \ln w^H + [1 - \pi(z)] \ln w^L \right\}. \end{aligned}$$

The solution (see Appendix) is

$$t_F^J = t_M^J = \frac{\delta}{w^J}. \quad (25)$$

Given (25), the Nash-bargaining equilibrium of a couple governed by a family constitution is

$$g^C = \frac{2\alpha\phi}{w} \quad (26)$$

$$b^C = 2\alpha r \quad (27)$$

$$s_f^C = 1 \quad (28)$$

$$s_m^C = 1 + 4\alpha \quad (29)$$

$$T^C = z^C - 2\alpha(1 - \phi) \quad (30)$$

$$\pi'(z^C) = \frac{1}{2(\alpha - \delta) \Delta \ln w}. \quad (31)$$

Therefore, g , b and s_i are the same as without the constitution. The difference is in z and T . If α is positive, educational expenditure is lower than it would be without a constitution,

$$z^C \leq \bar{z},$$

and will be actually zero if α is no larger than δ . In the presence of a family constitution, therefore, the equilibrium level of education may be zero even if the couple is altruistic. The intuition is straightforward. In the presence of a family constitution, education raises the probability that a child's wage rate will be high, but reduces the expected amount of attention that this child will give her or his parents. A couple governed

by such a constitution will then give their children an education if and only if they take more pleasure in seeing these children happy, than in receiving attention from them,

$$\alpha > \delta. \quad (32)$$

As the mother spends for the children's education less than she would in the absence of a family constitution, she will then receive a smaller (less positive or more negative) compensation,

$$T^C < \hat{T},$$

from the father.

Substituting from (25) into either (16) or (17), we get f 's and m 's common pay-off for marrying under the constitution,

$$\begin{aligned} EV^C = & w - 2\alpha(1 + \phi) - 2\delta - z^C - 1 + \ln r \\ & + 2\delta \left\{ \pi(z^C) \ln \frac{\beta\delta}{w^H} + [1 - \pi(z^C)] \ln \frac{\beta\delta}{w^L} \right\} \\ & + 2\alpha \left\{ \phi \ln \frac{2\alpha\phi}{w} + \pi(z^C) \ln w^H + [1 - \pi(z^C)] \ln w^L + \ln 2\alpha r \right\} \end{aligned} \quad (33)$$

We are now ready to address the question whether such a constitution exists. That is the same as asking whether EV^C is at least as large as $E\hat{V}$, and thus whether

$$\begin{aligned} & -2\delta(1 - \ln \beta\delta) \\ & + 2(\alpha - \delta) \{ \pi(z^C) \ln w^H + [1 - \pi(z^C)] \ln w^L \} - z^C \\ & \geq 2\alpha \{ \pi(\hat{z}) \ln w^H + [1 - \pi(\hat{z})] \ln w^L \} - \hat{z}. \end{aligned} \quad (34)$$

The first line of this condition is positive because $\beta\delta$ is greater than one. The second and third line are nonnegative for any positive level of educational expenditure, because they are the difference between the expected benefit and the cost of that expenditure with and without the constitution. Therefore, the condition will hold for some parameter configurations (in particular, it will hold for $\alpha = 0$), but not for others. Is that a problem? It would be if everybody had the same preferences, because in that case either all couples would be governed by a family constitution (the same for each of them), or none would. But not if people have different preferences, because in that case some couples may be governed by a family constitution (not necessarily the same for all of them), and some may not. That is consistent with the finding in Cigno et al. (2006) that a large share, but by no means the totality, of Italian adults behave as if they were governed by a family constitution.

5 Preference transmission

We have established that the (f, m) couple will be governed by a family constitution if their common preferences happen to satisfy (34). But this was on the assumption that those common preferences are the same as those of f 's and m 's parents, and as those of the couples formed by f 's and m 's children. If preferences were genetically inherited like physical traits, the probability that all siblings have the same preferences as their parents would be very small. Could they be imprinted or inculcated?

Bisin and Verdier (2001), and Tabellini (2008), assume that parents transmit their preferences to their offspring. Bisin and Topa (2003) show that it is possible to discriminate empirically between the effect of the family and the effect of society at large in the determination of cultural traits. Interestingly, Bjorklund et al. (2006) find evidence that the transmission mechanism works even in the absence of genetic links (e.g., in the case of adopted children). Albanese et al. (2016) find that family influence weakens during a person's formative years, when the person is confronted with the preferences of others. According to this sub-literature, public-minded parents choose to transmit what they consider to be the right values.

By contrast, Stark (1993, 1995) advances the hypothesis that adults take care of their elderly parents in order to impress on their children that they should do the same ("demonstration effect"), and try to shelter their children from the possibly adverse influence of the outside world by sending them to church, or enrolling them at schools that share the parents' own values. The motivation here is essentially selfish. Consistently with this hypothesis, but also with a host of alternative ones, Cox and Stark (2005) report evidence that couples with children are more likely to take care of elderly parents than either singles, or couples without children. Pezzin et al. (2009) similarly hypothesize that an able-bodied mother will provide care for her disabled partner in order to impress on her children that they should do the same for her when she in turn becomes disabled.¹⁷ The same authors report evidence that the presence of a child does indeed raise the probability that the able-bodied parent will care for the disabled one.

Our paper offers another possible motivation, mutual advantage, for

¹⁷The same paper examines also the alternative hypothesis that the able-bodied mother provides care for the disabled father because she fears that the children will otherwise punish her by denying her care when she in turn becomes disabled ("punishment effect"). The implicit assumption here is either that the children have an innate sense of justice, or that they are guided by some kind of family rule, akin to our idea of a family constitution (but the paper does not derive conditions for the existence of such a rule).

transmitting one's preferences to one's children. If preferences are of a certain kind (i.e., if they satisfy the conditions for the existence of a family constitution), not only those who transmit them, but also those who have them transmitted gain access to otherwise unattainable goods. Furthermore, those who hold these preferences will be motivated to seek out and marry like-minded persons of the opposite sex.

6 Policy analysis

We now come to the policy neutrality issue. With that purpose in mind, we compare the effects of a range of policies on the behaviour of couple governed by family constitutions, and of couples that are not so restricted.

6.1 One-off public transfer from children to parents

The first policy we consider is the promise to pay a lump-sum subsidy τ to all members of a certain generation when they will be old, financed by a lump-sum tax of the same size on all members of the next generation when they will be adults. This is to be interpreted as a one-off move (if *every* generation were taxed a fixed amount in favour of the preceding one, there would be no public intergenerational transfer). An example of such a policy are the "inaugural gains" enjoyed by the first generation of pensioners when the government introduces a pay-as-you-go public pension system. Another is debt-financed public expenditure. Assuming descending altruism, Barro (1974) shows that such a policy will be neutralized by a private transfer of opposite sign, because parents will perceive the subsidy as a tax on their children ("Ricardian equivalence"). In Barro's world, however, there is no sexual differentiation, no marriage, no bargaining between spouses, and no family rules. Does the same apply to our realistically more complicated world?

Take the (f, m) couple. If f and m are altruistic ($\alpha > 0$), and the policy is announced in period 1 of this couple's life, we can simply add τ to rs_i ($i = f, m$) in EV , and subtract it from b in EW . Following the same procedure as without the policy, we then find that, no matter whether a constitution is or is not in place, the policy will raise bequests by the amount of the subsidy, and lower (raise) the woman's (man's) savings by the present value of the same. The equilibrium values of g and z are not affected. If f and m are not altruistic ($\alpha = 0$), and again no matter whether a constitution is or is not in place, they will simply keep the subsidy. If all couples were altruistic, the policy would thus be neutralized by the induced change in bequest behaviour. Otherwise, the policy will make selfish couples better-off, and their children worse-off. Where this policy is concerned, family constitutions do not matter.

6.2 Wage redistribution

Our next experiment concerns a policy that systematically taxes high wages and subsidizes low ones. Unlike the previous one, this policy redistributes within rather than between generations, and it is permanent rather temporary. As it reduces the expected return to education, this policy will induce couples who would have chosen z positive without the policy to spend less for their children's education. But there may also be couples that would have chosen z equal to zero without the policy, will do so with the policy. The couples falling in this category include all the non-altruistic ones ($\alpha = 0$), and those that are governed by a family constitution but are not sufficiently altruistic ($\alpha \leq \delta$) to spend money for their children's education. The other policy effects are easily seen by looking at the extreme case where the policy equalizes take-home wage rates. If parents did not respond to the policy, everybody would then take home the same wage rate (lower than w^H , but higher than w^L). As parents will respond by spending nothing for their children's education ($\hat{z} = z^C = 0$ for $\Delta \ln w = 0$), however, and recalling that $\pi(0) = 0$, everybody will be paid w^L .

By the usual procedure we find that, given the policy, the Nash-bargaining equilibrium is

$$g(R) = \frac{2\alpha\phi}{w^L} \quad (35)$$

$$b(R) = 2\alpha r \quad (36)$$

$$z(R) = 0 \quad (37)$$

$$s_f(R) = 1 \quad (38)$$

$$s_m(R) = 1 + 4\alpha \quad (39)$$

$$T(R) = 2\alpha\phi - 2\alpha, \quad (40)$$

where the R label signals that wage redistribution is in action. The pay-off of marriage for a couple without a family constitution is

$$\begin{aligned} \hat{V}(R) = & w^L - 2\alpha(1 + \phi) - 1 + \ln r \\ & + 2\alpha \left(\phi \ln \frac{2\alpha\phi}{w^L} + \ln 2\alpha r + \ln w^L \right). \end{aligned}$$

If a family constitution exists, the rule determining how much attention each adult should give each of her or his elderly parents given the policy is

$$t_F = t_M = \frac{\delta}{w^L}. \quad (41)$$

For a couple governed by a family constitution, the pay-off of marriage is then

$$\begin{aligned} V^C(R) = & w^L - 2\alpha(1 + \phi) - 2\delta(1 - \ln \beta\delta) - 1 + \ln r \\ & + 2(\alpha - \delta) \ln w^L \\ & + 2\alpha \left(\phi \ln \frac{2\alpha\phi}{w^L} + \ln 2\alpha r \right), \end{aligned}$$

and the condition for the existence of such a constitution becomes

$$\ln \beta\delta > 1 + \ln w^L. \quad (42)$$

$$\begin{aligned} & -2\delta(1 - \ln \beta\delta) \\ & + 2(\alpha - \delta) \{ \pi(z^C) \ln w^H + [1 - \pi(z^C)] \ln w^L \} - z^C \\ \geq & 2\alpha \{ \pi(\hat{z}) \ln w^H + [1 - \pi(\hat{z})] \ln w^L \} - \hat{z}. \end{aligned} \quad (43)$$

Given that (42) does not necessarily hold even if $\alpha = 0$, while (34) does, the policy tightens the condition for the existence of a family constitution, and will consequently reduce the share of the adult population that is governed by one.

Are people at least as well-off with as without the policy? For a couple without a family constitution, that is the same as asking whether $\hat{V}(R)$ is at least as large as EV , or

$$\begin{aligned} & 2\alpha \{ \pi(\hat{z}) \ln w^H + [1 - \pi(\hat{z})] \ln w^L \} - \hat{z} \\ \leq & 2\alpha [\phi \ln w + (1 - \phi) \ln w^L] - (w - w^L), \end{aligned}$$

where $w \geq w^L$ is the wage rate that the couple would have without the policy. This condition does not hold for $\alpha = 0$, because in that case the LHS is zero and the RHS non-positive. It may hold for $\alpha > 0$, if $w = w^H$. It cannot hold if w is equal to w^L , because in that case the RHS would be $2\alpha \ln w^L$, which is necessarily lower than the LHS (otherwise $\hat{z}$ would be zero). For a couple with a family constitution, the question is whether $V^C(R)$ is at least as large as EV^C , or

$$2(\alpha - \delta) \ln w^L + 2\alpha\phi (\ln w - \ln w^L) \geq (w - w^L) + 2(\alpha - \delta) \{ \pi(z^C) \ln w^H + [1 - \pi(z^C)] \ln w^L \} - z^C$$

This condition will hold as an identity if $(\alpha - \delta)$ is non-positive, because in that case $z^C = 0$ and consequently $w = w^L$. For $(\alpha - \delta)$ positive, it may hold if $w = w^H$. Therefore, the policy would be neutral if all those without a constitution were selfish, and all those with a constitution were not sufficiently altruistic to spend money for their children's education. Otherwise, the policy may make some couples better-off, and some worse-off.

6.3 Compulsory education

Our last experiment concerns compulsory education. Suppose that the government imposes a minimum level of education, $\bar{z}$. Take the extreme case where $\bar{z}$ is higher than the z any couple would choose. Following the usual procedure, we then find that the Nash-bargaining equilibrium of a couple with wage rate w is

$$g(\bar{z}) = \frac{2\alpha\phi}{w} \quad (44)$$

$$b(\bar{z}) = 2\alpha r \quad (45)$$

$$s_f(\bar{z}) = 1 \quad (46)$$

$$s_m(\bar{z}) = 1 + 4\alpha \quad (47)$$

$$T(\bar{z}) = 2\alpha\phi + \bar{z} - 2\alpha. \quad (48)$$

For a couple without a family constitution, the pay-off of marriage is

$$\begin{aligned} E\hat{V}(\bar{z}) = & w - 4\alpha\phi - \bar{z} - 1 + 2\alpha\phi - 2\alpha + \ln r \\ & + 2\alpha \left\{ \phi \ln \frac{2\alpha\phi}{w} + \ln 2\alpha r + \pi(\bar{z}) \ln w^H + [1 - \pi(\bar{z})] \ln w^L \right\}. \end{aligned}$$

If a family constitution exists, it will prescribe (25) as it would without the policy. But the probability of earning a high wage rate is now $\pi(\bar{z})$, and the pay-off of marriage for a constitution-abiding couple is

$$\begin{aligned} EV^C(\bar{z}) = & w - 2\alpha\phi - 2\delta - \bar{z} - 1 - 2\alpha + \ln r \\ & + 2\delta \left\{ \pi(\bar{z}) \ln \frac{\beta\delta}{w^H} + [1 - \pi(\bar{z})] \ln \frac{\beta\delta}{w^L} \right\} \\ & + 2\alpha \left\{ \phi \ln \frac{2\alpha\phi}{w} + \ln 2\alpha r \right\} \\ & + 2\alpha \left\{ \pi(\bar{z}) \ln w^H + [1 - \pi(\bar{z})] \ln w^L \right\}. \end{aligned}$$

With the policy, the condition for the existence of a family constitution becomes

$$\ln \beta\delta \geq 1 + \pi(\bar{z}) \ln w^H + [1 - \pi(\bar{z})] \ln w^L \quad (49)$$

This condition will hold for some parameter configurations and not for others. For some, it will hold as an equation, but we cannot say, as we did in the absence of policy, that it will do so for $\alpha = 0$. Therefore, in general, the policy may raise or lower the share of constitution-abiding couples in the adult population. For any given w , and irrespective of whether the couple is or is not governed by a family constitution, the policy makes people worse-off because it distorts their choice of z . However, the policy makes it more likely that the couple's w will be equal to w^H . On average, therefore, the policy *may* make people better-off.

7 Conclusion

The aim of this paper was to establish (a) whether the notion that individuals are constrained by family constitutions carries over from a world where people reproduce, so to speak, by cell separation, to one where reproduction is normally the outcome of the union of two persons of different sex, who will then bargain over the allocation of domestic resources, and (b) whether the proposition that any public action, permanent or temporary, distortionary or non distortionary, will be neutralized by private reaction extends from a world where everyone is altruistically linked to everyone else, to one where some are linked also or instead by family constitutions.

The answer to (a) is positive if preferences are transmitted from parents to children, and having the same preferences is a criterion for forming a couple. We have argued that it is in the interest of a person whose preferences are compatible with the existence of a family constitution to marry a person with the same preferences, and to endeavor to pass those preferences on to the children. This argument is consistent with evidence that preferences are transmitted from parents to children, and that a share of the adult population behaves as if a family constitution were in place.

The answer to (b) is negative. A one-off public transfer from parents to children would be neutralized by a private transfer of opposite sign if all parents were altruistic. Otherwise, the policy would make selfish parents better-off, and their children worse-off. Of the policies considered, this is the only one that is not affected by the possible existence of family constitutions. Wage redistribution would be neutral if all those who are not governed by a family constitution were selfish, and all those who are were not sufficiently altruistic to spend money for their children's education. Otherwise, the policy may make some couples better-off, and some worse-off. This policy tightens the condition for the existence of a family constitution, and would consequently reduce the share of the adult population that is governed by one. Compulsory education may raise or lower the share of constitution-abiding couples in the adult population. Ex-post (i.e., for any given realization of a couple's wage rate), it will and makes couples worse-off. Ex-ante, however, it may make the average couple better-off.

8 Appendix

8.1 Nash-bargaining in the absence of a family constitution

For $\alpha > 0$, the FOCs for the maximization of (1) are

$$\begin{aligned}\frac{\partial N}{\partial T} &= (EV_f - R) - (EV_m - R) = 0 \\ \frac{\partial N}{\partial g} &= -2w(EV_m - R) + \frac{2\alpha\phi}{g}(EV_f - R + EV_m - R) = 0 \\ \frac{\partial N}{\partial z} &= -2(EV_m - R) + 2\alpha\pi'(z)(\ln w^H - \ln w^L)(EV_f + EV_m - 2R) = 0 \\ \frac{\partial N}{\partial s_f} &= \left(-1 + \frac{r}{rs_f}\right)(EV_m - R) = 0 \\ \frac{\partial N}{\partial s_m} &= \left(-1 + \frac{r}{rs_m - 2b}\right)(EV_f - R) = 0 \\ \frac{\partial N}{\partial b} &= \left(\frac{-2}{rs_m - 2b}\right)(EV_f - R) + \frac{2\alpha}{b}(EV_f - R + EV_m - R) =\end{aligned}$$

Using the first of these equations, the conditions on g , z and s_f yield

$$\hat{g} = \frac{2\alpha\phi}{w},$$

$$\pi'(\hat{z}) = \frac{1}{2\alpha(\ln w^H - \ln w^L)}$$

and

$$\hat{s}_f = 1.$$

The condition on s_m can then be re-written as

$$\frac{1}{rs_m - 2b} = \frac{1}{r},$$

which substituted back into the conditions for b , s_m and T yields

$$\hat{b} = 2\alpha r,$$

$$\hat{s}_m = 1 + 4\alpha$$

and

$$\hat{T} = 2\alpha\phi + \hat{z} - 2\alpha.$$

8.2 Nash-bargaining in the presence of a family constitution

For $\alpha > 0$, the FOCs for the maximization of (15) are

$$\begin{aligned}
\frac{\partial N}{\partial T} &= (EV_f - E\hat{V}_f) - (EV_m - E\hat{V}_m) = 0 \\
\frac{\partial N}{\partial g} &= -2w (EV_m - E\hat{V}_m) + \frac{2\alpha\phi}{g} (EV_f - E\hat{V}_f + EV_m - E\hat{V}_m) = 0 \\
\frac{\partial N}{\partial z} &= -2 (EV_m - E\hat{V}_m) + \delta\pi'(z) [(\ln \beta t_f^H + \ln \beta t_m^H) - (\ln \beta t_f^L + \ln \beta t_m^L)] \\
&\quad * (EV_f - E\hat{V}_f + EV_m - E\hat{V}_m) \\
&\quad + 2\alpha\pi'(z) (\ln w^H - \ln w^L) (EV_f - E\hat{V}_f + EV_m - E\hat{V}_m) = 0 \\
\frac{\partial N}{\partial s_f} &= \left(-1 + \frac{r}{rs_f}\right) (EV_m - E\hat{V}_m) = 0 \\
\frac{\partial N}{\partial s_m} &= \left(-1 + \frac{r}{rs_m - 2b}\right) (EV_f - E\hat{V}_f) = 0 \\
\frac{\partial N}{\partial b} &= \left(\frac{-2}{rs_m - 2b}\right) (EV_f - E\hat{V}_f) + \frac{2\alpha}{b} (EV_f - E\hat{V}_f + EV_m - E\hat{V}_m) = 0.
\end{aligned}$$

Following the same procedure as in the case without the constitution, we find

$$\begin{aligned}
g &= \frac{2\alpha\phi}{w}, \\
\pi'(z) &= \frac{1}{\delta [(\ln t_F^H + \ln t_M^H) - (\ln t_F^L + \ln t_M^L)] + \alpha (\ln w^H - \ln w^L)}, \\
s_f &= 1, \\
b &= 2\alpha r, \\
s_m &= 1 + 4\alpha, \\
T &= w(t_F - t_M) + 2\alpha\phi + z^C - 2\alpha.
\end{aligned}$$

Substituting back into the expressions for EV_f or EV_m , and setting

$$t_f^J = t_D^J = t_F^J, \quad t_m^J = t_S^J = t_M^J, \quad J = H, L,$$

the value of EV_i expected before w is revealed is

$$\begin{aligned}
E(EV_i) &= E(EV) \\
&= \pi(z^C) w^H (1 - t_F^H - t_M^H) + [1 - \pi(z^C)] w^L (1 - t_F^L - t_M^L) + \\
&\quad - z^C - 2\alpha\phi - 1 - 2\alpha + \ln[r] \\
&\quad + \delta \left\{ \pi(z^C) (\ln \beta t_F^H + \ln \beta t_M^H) + [1 - \pi(z)] (\ln \beta t_F^L + \ln \beta t_M^L) \right\} \\
&\quad + 2\alpha \left[\pi(z^C) \phi \ln \frac{2\alpha\phi}{w^H} + [1 - \pi(z^C)] \phi \ln \frac{2\alpha\phi}{w^L} \right] \\
&\quad + 2\alpha \left\{ \ln(2\alpha r) + \pi(z^C) \ln w^H + [1 - \pi(z^C)] \ln w^L \right\}.
\end{aligned}$$

The FOCs for the maximization of $E(EV)$,

$$\frac{\partial E(EU)}{\partial t_F^j} = -w^j + \frac{\delta}{t_k^j} = 0$$

and

$$\frac{\partial E(EV)}{\partial t_M^j} = -w^j + \frac{\delta}{t_k^j} = 0,$$

yield (25).

REFERENCES

- Aghion, P., M. Dewatripont and P. Rey (1990), On Renegotiation Design, *European Economic Review* 34, 322-329
- Albanese, G., G. De Blasio and P. Sestito (2016), My Parents Taught Me: Evidence on the Family Transmission of Values, *Journal of Population Economics* 29, 571-592
- Altonji, J. G., F. Hayashi and L. J. Kotlikoff (1992), Is the Extended Family Altruistically Linked? Direct Tests Using Micro Data, *American Economic Review* 82, 1177-1198
- Anderberg, D. and A. Balestrino (2003), Self-enforcing Intergenerational Transfers and the Provision of Education, *Economica* 70, 55-71
- Andreoni, J. (1990), Impure Altruism and Donations to Public Goods: A Theory of Warm-Glow Giving, *Economic Journal* 100, 464-477
- Arrondel, L. and A. Masson (2006), Altruism, Exchange or Indirect Reciprocity: What do the Data on Family Transfers Show?, in S. C. Kolm and J. Mercier Ythier (eds.), *Handbook of the Economics of Giving, Altruism and Reciprocity*, Vol. 2, 971-1036. Amsterdam: Elsevier North Holland Elsevier
- Barro, R. J. (1974), Are Government Bonds Net Wealth?, *Journal of Political Economy* 82, 1095-1117

- Becker, G. S. (1974), A Theory of Social Interactions, *Journal of Political Economy* 82, 1063-1093
- Ben-Porath, Y. (1980), The F-Connection: Families, Friends and Firms, and the Organization of Exchange, *Population and Development Review* 6, 1-30
- Bernheim, B. D. and K. Bagwell (1988), Is Everything Neutral? *Journal of Political Economy* 96, 308-338
- and D. Ray (1989), Collective Dynamic Consistency in Repeated Games, *Games and Economic Behavior* 1, 295-326
- , A. Schleifer. and L. H. Summers (1985), The Strategic Bequest Motive, *Journal of Political Economy* 93, 1045-1076
- Bisin, A. and T. Verdier (2001), The Economics of Cultural Transmission and the Dynamics of Preferences, *Journal of Economic Theory* 97, 298-319
- and G. Topa (2003), Empirical Models of Cultural Transmission, *Journal of the European Economic Association* 1, 363-375
- Bjorklund, A., M. Lindahl and E. Plug (2006), The Origins of Intergenerational Associations: Lessons from Swedish Adoption Data, *Quarterly Journal of Economics* 121, 999-1028
- Bruce, N. and M. Waldman (1990), The Rotten Kid Theorem Meets the Samaritan Dilemma, *Quarterly Journal of Economics* 105, 1165-1182
- Bull, C. (1987), The Existence of Self-Enforcing Implicit Contract, *Quarterly Journal of Economics* 102, 147-159
- Caillaud, B. and D. Cohen (2000), Intergenerational transfers and Common Values in a Society, *European Economic Review* 44, 1091-1103
- Chang, Y.-M. and L. Zijun (2015), Endogenous Division Rules as a Family Constitution: Strategic Altruistic Transfers and Sibling Competition, *Journal of Population Economics* 28, 173-194
- Chiappori, P. A., M. Iyigun and Y. Weiss (2009), Investment in Schooling and the Marriage Market, *American Economic Review* 99, 1689-1713
- and Y. Weiss (2007), Divorce, Remarriage, and Child Support, *Journal of Labor Economics* 25, 37-74
- Cigno, A. (1991), *Economics of the Family*. Oxford and New York: Clarendon Press and Oxford University Press
- (1993), Intergenerational Transfers without Altruism: Family, Market and State, *European Journal of Political Economy* 9, 505-518
- (2006), A Constitutional Theory of the Family, *Journal of Population Economics* 19, 259-283
- (2007), A Theoretical Analysis of the Effects of Legislation on Marriage, Fertility, Domestic Division of Labour, and the Education of Children, CESifo WP 2143

- (2012), Marriage as a Commitment Device, *Review of Economics of the Household* 10, 193-213
- (2014), Is Marriage as Good as a Contract? *CESifo Economic Studies* 60, 599-612
- , L. Casolaro and F. C. Rosati (2003a), The Impact of Social Security on Saving and Fertility in Germany, *FinanzArchiv* 59, 189-211
- , G. C. Giannelli, F. C. Rosati and D. Vuri (2006), Is There Such a Thing as a Family Constitution? A Test Based on Credit Rationing, *Review of Economics of the Household* 4, 183-204
- and F. C. Rosati (1992), The Effects of Financial Markets and Social Security on Saving and Fertility Behaviour in Italy, *Journal of Population Economics* 5, 319-341
- and F. C. Rosati (1996), Jointly Determined Saving and Fertility Behaviour: Theory, and Estimates for Germany, Italy, UK, and USA, *European Economic Review* 40, 1561-1589
- and F. C. Rosati (1997), Rise and Fall of the Japanese Saving Rate: the Role of Social Security and Intra-Family Transfers, *Japan and the World Economy* 9, 81-92
- and F. C. Rosati (2000), Mutual Interest, Self-Enforcing Constitutions and Apparent Generosity, in L. A. Gérard-Varet, S. C. Kolm and J. Mercier Ythier (eds.), *The Economics of Reciprocity, Giving and Altruism*, 226-247. London and New York: MacMillan and St. Martin's Press
- Cox, D. and O. Stark (2005), On the Demand for Grandchildren: Tied Transfers and the Demonstration Effect, *Journal of Public Economics* 89, 1665-1697
- Cremer, H. and P. Pestieau (1996), Bequests as a Heir "Discipline Device", *Journal of Population Economics* 9, 405-414
- and K. Roeder (2017), Rotten Spouses, Family Transfers and Public Goods, *Journal of Population Economics* 30
- Crimmins, E. M., and D. Ingegneri (1990), Interactions and Living Arrangements of Older Parents and their Children, *Research on Aging* 12, 3-35
- Dewatripont, M. and E. Maskin (1990), Contract Renegotiation in Models of Asymmetric Information, *European Economic Review* 34, 311-321
- Galasso, V., R. Gatti and P. Profeta (2009), Investing for the Old Age: Pensions, Children and Savings, *International Tax and Public Finance* 16, 538-559
- Laitner, J. (1997), Intergenerational and Interhousehold Economic Links, in M. R. Rosenzweig and O. Stark (eds.), *Handbook of Population and Family Economics*, Vol. 1A, 189-238. Amsterdam: Elsevier North

Holland

Lam, D. (1988), Marriage Markets and Assortative Mating with Household Public Goods: Theoretical Results and Empirical Implications, *Journal of Human Resources* 23, 462-487

Levin, J. (2003), Relational Incentive Contracts, *American Economic Review* 93, 835-856

MacLeod, B. W. and J. M. Malcomson (1989), Implicit Contracts, Incentive Compatibility and Involuntary Unemployment, *Econometrica* 57, 447-480

Manser, M. and M. Brown (1980), Marriage and Household Decision-Making: A Bargaining Analysis, *International Economic Review* 21, 31-44

Maskin, E. and J. Farrell (1989), Renegotiation in Repeated Games, *Games and Economic Behavior* 1, 327-360

Neeman, Z. and G. Pavlov (2013), Ex Post Renegotiation-Proof Mechanism Design, *Journal of Economic Theory* 148, 473-501

Peters, M. and A. Siow (2002), Competing Premarital Investments, *Journal of Political Economy* 110, 592-608

Pezzin, L. E., R. A. Pollak and B. Schone (2009), Long-Term Care of the Disabled Elderly: Do Children Increase Caregiving by Spouses? *Review of Economics of the Household* 7, 323-339

Rosati, F. C. (1996), Social Security in a Non-Altruistic Model with Uncertainty and Endogenous Fertility, *Journal of Public Economics* 60, 283-294

Stark, O. (1993), Nonmarket Transfers and Altruism, *European Economic Review* 37, 1413-1424

——— (1995), *Altruism and Beyond: An Economic Analysis of Transfers and Exchanges within Families and Groups*, Cambridge: Cambridge University Press

Tabellini, G. (2008), The scope of Cooperation: Values and Incentives, *Quarterly Journal of Economics* 123, 905-950