Why Can't I Keep My Surname? An Analysis of the Fairness and Welfare of the Japanese Legal System

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Abstract

This study examines the welfare and fairness of Japan's current versus revised family law, which will enable husbands and wives to retain their premarital surnames. We compare welfare in these two legal states, with a married couple's welfare dependent on marriage–surname choice. The external preferences of anti-revisionists are reviewed by the fairness criteria of impersonality or extended sympathy. Utilising web-based survey data, we conduct nonparametric rank analysis and parametric analysis of willingness to pay for surname retention and legal support. Moreover, structural equation analysis via a multiple indicators multiple causes model is conducted incorporating surname attachment and fairness as latent variables. We show that welfare can be increased by the revised law, and that external disutility of the legal revision is invalid on fairness grounds.

Keywords: fairness; family law; gender; welfare; external preferences; surname

JEL Classification : D63; J16; K36; Z13

1. Introduction

More than three decades have passed since Japan's ratification of the United Nations Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) in 1985, and yet, Japan's insufficient efforts to fulfil its obligations were criticised by independent experts at the CEDAW Committee meeting in 2003, 2009, and again in 2016, and remain largely unchanged.[1] The Committee experts pointed out that Japanese civil legislation remained discriminatory in such areas as requiring a common married surname, different minimum marriage ages for men and women, a ban on women's remarriage within six months of divorce,[2] and discrimination against children born outside legal marriage. The committee expressed concern that the Japanese government may not have taken the Convention's binding provisions seriously.[3]

In this study, we examine whether Japan's proposed dual surname (DS) system, which allows husbands and wives to choose to retain their original surnames, will be 'welfare' improving and fairer than the current system, in which a married couple ought to have a common surname (CS).[4] We first briefly review the current legal situation and arguments for and against the DS system in Japan. We then present an analytical framework of welfare improvement, comparing the current and revised legal states. We review the fairness of these states, based on the criteria proposed by Rawls (1958, 1971/1999), Harsanyi (1955), and Suppes (1966), also referring to philosophical discussions on 'external preferences'. After introducing the empirical framework and the data collected

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[1] As of May 2015, 189 states have ratified or acceded to the treaty. The United States is the only country which has not done so in OECD countries.

[2] The ban on remarrying within 300 days was ruled unconstitutional by the Supreme Court in December 2015, although the restriction remained in place for 100 days, and the ruling became effective after cabinet approval in March 2016. Nonetheless, the CEDAW Committee condemns the prohibition imposed only on women for being discriminatory against women.

[3] *Asahi Shimbun.* 2009. 'U.N. panel raps Japan on women's issues' July 25. http://www.asahi.com/international/update/0724/TKY200907240216.html (in Japanese).

[4] The word 'welfare' is utilised here, however, the concept applied here can be considered in a broader sense, such as 'capability' in Sen's sense.

from web-based surveys, we provide an overview of the current situation in Japan, and analyse the possibilities and magnitude of welfare and fairness improvement from the DS system, through a non-parametric and parametric analysis of willingness to pay (WTP) and a multiple indicators multiple causes (MIMIC) generalised structural equation model. We conclude with policy recommendations. Although this study examines the DS system in Japan, the welfare and fairness methodologies could apply to various matters.

2. Current situation and legislative background

Under the current Japanese Civil Code (Article 750), a married couple must have a unified surname upon their marriage, taken from either of them.[5] The law prescribes either of the surnames to be adopted as the new couple's family name, and thus, it seems prima facie egalitarian. However, the reality is that 96 % of all couples and 97.1% of first-marriage couples adopted the husband's surname in 2015, almost unchanged for a decade (Japan Ministry of Health, Labour and Welfare, MHLW, 2017). If couples do not wish to change their original surnames upon marriage, there are currently two options available. One is to have a de facto or common-law marriage, in which they consider themselves married, are recognised as such by others, and may have a religious or non-religious marriage ceremony, or some celebration that publicly announces their marriage. However, they are not legally recognised in the official marriage registry, and the couple will not have certain legal rights such as, for instance, default inheritance rights in principle or rights to make 'significant' decisions for partners, such as agreements for operations, except for sterilisation, as defined by the Maternal Protection Law. Only one of the parents of a child born to a de facto married couple can be registered as a legal parent, where the mother is the default. A child born without a legal father is classified as illegitimate in the family register, with only half the inheritance right of a legitimate child,

[5] This article applies to all cases in which both partners of the couple are Japanese citizens.

although this law, judged unconstitutional by the Supreme Court, was finally amended in December 2013.[6]

The second option for retaining one's original surname upon marriage is for one partner to utilise his/her original surname as an alias, after a formal marriage registry. In fact, one of the major concerns regarding surname change relates to those who continue to work after marriage. Although the Japanese employment rate for married women is still low compared to other developed countries, the ratio of double-income households to all working households has been increasing. It was 37.05% in 1989 and increased to 42.05% in 2004, 53.7% in 2007, and 57.2% in 2012, based on the latest available employment structure statistics (Statistics Bureau and the Director−General for Policy Planning of Japan, 2007, 2013).[7]

2.1 Existing Problems: Professional and Personal Rights

Sudden change of surnames can cause certain inconveniences to working women. Goldin and Shim (2004) show that in the US, whether a woman 'made a name' for herself before marriage matters significantly in the choice of retaining her original surname. Hoffnung (2006), using the same data for a 10 year-longitudinal survey, found that those who chose non-traditional marital names had greater career commitment. Indeed, a name change can incur adverse effects on a professional career, nullifying her achievement record and/or confusing her clients, students, colleagues, business partners and the like. For an academic or researcher, a surname change may practically nullify her publication record. For a teacher, a surname change can confuse the students and parents. For a salesperson, a surname change may confuse her customers and may even spoil her sales record. People whose names are publicly known may have already been using a public name, continued use of which has been largely accepted. In Japan, it is only recent that

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[66] The ratio of children born outside wedlock is extremely low in Japan compared to other OECD countries

[7] Households in the agricultural sector are excluded from working households.

ordinary people have been allowed to retain their maiden names in the workplace, albeit at their employers' discretion. Recently, a female teacher reached a settlement with her employer private high school that allows her to continue using her maiden name after marriage, mediated by the Tokyo High Court, following the dismissal by the Tokyo District Court (*The Japan Times*, 17 March 2017). Moreover, although an alias may be utilised in a professional situation, this is not the case in the sphere of public administration, such as salary payment, tax, health insurance, public benefit, passport, and driving licenses. Consequently, the rule of using the officially registered surname extends to bank accounts, credit cards, and other things that require submission of official identification. Thus, the utilisation of alias is not considered sufficient to overcome various complications associated with surname change.

Another major claim for enabling DS in Japan and elsewhere relates to identity and respect for ancestral name.[8] With the current CS system, either partner in a couple has to change his/her birth surname and this can pose a serious obstacle to the marriage itself, especially if he/she is the only child. The significance of ancestry and surname continuity is also found in other countries (Scheuble & Johnson, 1993; Klein, Stafford, & Miklosovic, 1996) and is indicated by the fact that certain cultures regard hyphenated surnames as the standard, such as in Spain and Portugal. Mizuno (2007), in her elaborate analysis of Japanese Family Law, argues that 'legal marriage has come to be considered as a combination of forcing one to renounce their family name and submit to the violation of personal privacy rights brought about by the family register system' (p. 154).[9] Indeed, the recent law suit by a female teacher, cited above, was labelled as "personal right infringement suit" by one of the major newspapers *Mainich*i in Japan.

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[8] In Japanese culture, 'keeping the ancestral grave' is considered important and usually a wife will be buried in her husband's family grave. This tradition, which has started to change in recent decades, reinforces the importance of family continuity and name-keeping especially for one-child families.

[9] She makes particular reference to the Japanese *ie* system, a patriarchal household system that forms the conceptual foundation of family registry.

2.2 Legislative Situation

In Japan, discussions regarding the amendment of the Civil Law have been ongoing since the late 1970s. Major discussions revolved around concerns over practical inconveniences for women's work life rather than egalitarian concerns or personal identity. Thus, a major trend was set toward acceptance of alias in the workplace. The trend has shifted gradually to a 'selective DS system', in which husbands and wives each are allowed to keep their own surnames upon marriage, if desired. As part of its commitment to meeting the CEDAW obligations, Japan enacted the Basic Law for a Gender−Equal Society (Law No. 78 of 1999) in 2000, and established the Bureau of Gender Equality to deploy various policies. Legislative reform proposals to allow selective DS were prepared by the Ministry of Justice in 1996 and again in 2010. Ultimately, these proposals were not submitted to the Diet due to 'variations in people's opinion', although it is primarily due to the failure to reach 'consensus' among the leading Liberal Democratic Party (Japan Ministry of Justice 2014).[10] The Supreme Court delivered its first judgement on the constitutionality of the current Civil Code Article 750 requiring CS on 16 December 2015, ruling it to be 'established institution and rational, thus not unconstitutional', and leaving the matter to be discussed in the Diet, although 5 out of 15 judges decided that it was unconstitutional.[11] To date, the reform proposal has not yet been brought to substantive deliberations.

2.3 Concerns for Legislative Change and Other Country Experiences

There are various claims for and against amending the Civil Code to legalise the DS option. Many claims are similar to those observed in the US some 40 years ago, when

[10] The Liberal Democratic Party at both the national and local levels is infamous for its conservative sexist values.

[11] On the same day, another judgement was delivered on Civil Code Article 733, restricting divorced women from remarrying for 300 days. The Supreme Court ruled that part of the restriction exceeding 100 days was unconstitutional.

there were concerns about 'threat to familial harmony and stability', as well as expected 'confusion in record−keeping and legal relationships' (Gordon, 1974, pp. 1514–1515). Such social norms seem to have persisted for some time: according to a study by Scheuble and Johnson (1993), one−third of American men believe that a woman should always change her name to that of her husband and more than 50% believe that a woman should change her name if she has or plans to have children. A brief summary of the major opinions of the pro-revisionists and anti-revisionists in Japan is provided in Table 1.

[Insert Table 1 around here]

Despite the 'fear' of DS opponents that family values will be degraded, it would be difficult to find evidence of DS itself 'causing' family value degradation in other countries. Indeed, divorce rate in Japan has steadily been increasing for most years while marriage rate decreasing. The ratio of divorce rate to marriage rate has changed from 0.098 in 1970 to 0.217 in 1990, and 0.362 in 2010 (MHLW, 2016).[12] Moreover, the proposed legal revision is a *selective* surname system; a couple can always opt for a conventional choice, which is the default. Our data suggest that DS couples would be a minority, similar to the observations in other countries where such options are legalised, such as the case in Norway where traditional marital surname choice prevails in 80% of the cases even the legal default is name keeping (Noak and Wiik, 2008). The options elsewhere typically include DS, hyphenated surname, and birth surname as middle name. For instance, a Norwegian case study by Noak and Wiik (2008) reports that traditional marital surname choice prevails in 80% of the cases, that is, wives adopt husbands' surnames, even though women were granted equal rights to retain their original surnames in 1980. Moreover, the legal default in Norway is name keeping: those wishing to change their names must notify authorities. The role of 'default choices' revealed in the work of

[12] Marriage rate and divorce rate are defined as the case numbers per 1,000 population in any given year. The latest figure is 0.346 in 2016.

Madrian and Shea (2001) on a retirement plan does not seem to be functioning here. Noak and Wiik (2008) claim that name choice is closely linked to 'gender ideology'. In the US, the legal default in most places is for both spouses to keep their pre-marital names, yet most women choose the most conventional surname, because 'naming choices are constrained by the social and historical context in which they are made', and 'current preferences are endogenous to the state's previous mandatory regime' (Emens, 2007). Therefore, it seems highly unlikely that a selective surname system would provoke any drastic change in social values in Japan.

In general, opinions on Japan's selective DS system seem to be still divided, although a fair proportion of the public accept the law amendment, based on government and web surveys cited below. Ultimately and ideally, the society should decide whether to allow the right to choose DSs. Put another way, the society should decide whether such a provision is 'desirable' in the sense that it is fairer and/or welfare increasing for the society. In order to consider the welfare and fairness of the law pertaining to the surname choice, we present a simple analytical model in Sections 3 and 4.

3. Welfare improvement analytical framework

One characteristic of the proposed law change for the selective DS system is that it will *additionally allow* DS as one option for married surname, and thus, will not deny or restrict the choice of CS, which currently is the sole choice.[13] Therefore, it seems there are only people who would benefit from the additional option, and thus, it would be welfare and Pareto improving. Table 2 depicts the choice sets and welfare of a couple in terms of marriage and surname choice. Each individual in the couple is categorised into one of three types according to their own surname preference, *retain*, *change*, and *indifferent*. Couples with *change–change* preferences, where both parties wish to change

[13] Of course, a case may be considered in which a married couple combines both surnames with hyphenation, but this option is beyond current considerations in Japanese society.

their pre-marital surname to those of the partners, are considered rare; this option is unavailable in the proposed legal change and thus omitted. Here, two right sets are assumed: (1) S^m for rights to a marriage choice set containing *m1*, 'exercise a right to legal marriage' and *m0*, 'relinquish a right to legal marriage'; (2) S^n for rights to a surname choice set containing *n1*, 'exercise a right to keep one's surname', and *n0*, 'relinquish a right to keep one's surname'.[14] The weak preference ordering for the choice of marriage right, satisfying reflexivity, transitivity, and completeness, is defined as: $\forall m \in S^m$, $m1 \succsim m0$, that is, 'exercise a right to legal marriage (*m1*)' is weakly preferred to 'relinquish a right to legal marriage (*m0*)'.[15] Given Japanese family law, we assume that a legal marriage is strictly preferred to $m1 \succsim m0$ and $\sim (m0 \succsim m1)$, where '~' indicates negation, and the corresponding welfare is $W^H(m1) > W^L(m0)$, where superscripts *H* and *L* denote high and low, respectively.[16] As for surname choice, $\forall n \in S^n$, $n1 \succsim n0$, that is, 'exercise a right to keep one's surname (*n1*)' is weakly preferred to 'relinquish a right to keep one's surname (*n0*)'. For a *retain* individual, $n1 \succsim n0$ and $W^H(n1) > W^L(n0)$, while for a *change* individual, $n0 \succsim n1$ and $W^H(n0) > W^L(n1)$. For an *indifferent* individual, 'retaining surname' and 'changing surname' is equally as good, $n1 \succsim n0$ and $n0 \succsim n1$, and thus, $W^H(n1) = W^H(n0)$. There is only one case, the *retain–retain* case in *state1*, in which preferential ordering between *m* and *n* is revealed; choosing to marry and sacrificing the right to a preferred surname reveals $m1 \succsim n1$, while choosing not to marry but retain one's preferred surname reveals $n1 \succsim m1$.

[Insert Table 2 around here]

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[14] While it is more usual to consider *S* as a direct choice set of 'legal marriage' or 'retain surname', our choice assignment over a right highlights the fact that certain individuals have to relinquish the right.

[15] Since the choice set contains only two choices in case of marriage, transitivity contains a hypothetical element. Here, reflexivity implies that $\forall m1 \in S^m$: $m1 \succsim m1$ and completeness implies that $\forall m1, m0 \in S^m$: $(m1 \neq m0) \rightarrow (m1 \succsim m0) \veebar (m0 \succsim m1)$, where $\veebar$ indicates the inclusive 'or' or alternation.

[16] Given current circumstances, it is presumed that legal marriage can occur only among heterosexual couples who are not within the third degree of kinship, and a married surname can be only either partner's surname, although the same framework can apply to other issues, such as same-sex marriage.

Based on preference ordering, the marriage−surname welfare of the *retain–retain* couple in *state1* (*S1*), $W^{HH}-W^{HL}$ or $W^{LH}-W^{LH}$ is inferior to that in *state2* (*S2*), $W^{HH}-W^{HH}$. The welfare of *retain–retain* is actually inferior to any other couple combination. Since the welfare of all other couple types is the same in *S1* and *S2*, social welfare in *S2* is superior to that in *S1*. Accordingly, it seems to be a natural conclusion to change the family law to allow for selective DS. Thus, why should there be opposition? The opposition comes from people who would incur disutility from other people's decision to have DSs. They argue that DSs would degrade family norms of the society and be harmful to children. For them, the current legal status entails a single equilibrium they consider justifiable and proper. Thus, we cannot use a simple Pareto criterion to judge different legal states since the status quo would be justified automatically. Such external concerns do not enter a couple's welfare function regarding their marriage–surname choice, and so, the question arises whether they should be given any consideration in the social welfare function.

4. External preferences and fairness

How much of the 'external (dis)utility' of the DS system by outside parties, in particular the CS−proponents, should be counted in a civilised society?[17] Going back to Bentham (1789/1823, pp. 14–16), a founder of modern utilitarianism who recognised the importance of the roles of legal institution, objects to 'the principle of sympathy and antipathy', by which he meant external approbation or disapprobation of certain actions without any consideration for the happiness of the party whose interest is in question. Bentham's critical successor Mill (1859/1951) warns against the majority's imposition of its values and preferences on the minority, arguing that "public opinion means, at the best, some people's opinion of what is good or bad for other people; while very often it does not even mean that; the public, with the most perfect indifference, passing over the

[17] Although the topic of this study is DS in Japan, this argument can be applied to any issues concerning equality of entitlements in which certain groups are denied their personal rights.

pleasure or convenience of those whose conduct they censure, and considering only their own preference" (pp. 188–189). Similarly, the contemporary American philosopher Dworkin (1977/1997) asserts that a *personal* preference for own enjoyment and an *external* preference for another's enjoyment should be distinguished (his italics). He claims that '[i]f external preferences tip the balance, then the fact that a policy makes the community better off in a utilitarian sense would *not* provide a justification compatible with the right of those it disadvantages to be treated as equals' (Dworkin, 1977/1997, p. 282).

Seeing that the sort of external or 'extrinsic' utility we deal with should not be included in the social welfare function, there remains a question of *fairness* given different levels of welfare currently obtainable by *retain−change* couples and *retain−retain* couples, leaving aside cases involving indifferent surname preference without any harm.[18] This in turn requires some sort of interpersonal comparison.[19] As Sen (1970, p. 131) states, one of the most practiced and accepted methods of interpersonal comparison is to 'try to put oneself in the position of another'. We consider a few variants of such an approach, proposed by Rawls (1971/1999), Harsanyi (1955), and Suppes (1966).[20] We consider here only cases in which legal state preference and surname preference match. Thus, in this case a CS-proponent (pro-CS, CS^p) or anti-revisionist, who resists the legal amendment and can avail himself of the preferred surname choice *retain−change* as a couple, puts himself in a DS-proponent (pro-DS, DS^p) or revisionist's shoes, who cannot avail herself of the preferred surname choice *retain−retain*, and vice versa. There is

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[18] This fairness concern would correspond to 'moral preferences' defined by Harsanyi (1977, p. 635), which enforces 'a special impersonal and impartial attitude, that is, a moral attitude, upon himself'. The definitions and distinctions Harsanyi applied to 'personal preferences' and 'moral preferences' are not equivalent to those of Dworkin's 'personal preferences' and 'external preferences'. Nevertheless, Harsanyi (1977, p. 635) states that 'moral preference' influences one's behaviour on 'rare' occasions, and thus, he seems to have been considering strict impartiality. He defines several other preferences in his work.

[19] While Bentham regarded welfare straightforwardly calculable and comparable, Mill did not.

[20] Sen (1970) provides a concise and excellent discussion regarding their arguments related to the issues of equity and justice..

certainly another individual who is policy indifferent although we do not need to consider it for our purpose.

First, consider the situation of Rawls' (1971/1999) 'original position' in which the 'veil of ignorance' prevails; in this case, an individual does not know in which state of the world he or she would be born, nor whether he or she would be born as a DS^p or a CS^p, or as female or male. In that case, which conception of justice, or more precisely in our case, which state of the world is to be chosen? In the original position, according to Rawls (1958, p. 165), two principles of justice would have been chosen. The first states 'each person participating in a practice, or affected by it, has an equal right to the most extensive liberty compatible with a like liberty for all'. The current situation, which effectively denies equal right to the liberty of choosing one's preferred surname type as well as that of retaining one's original surname, is not in accordance with this principle. The second principle states that 'inequalities are arbitrary unless it is reasonable to expect that they will work out for everyone's advantage, and provided that the positions and offices to which they attach, or from which they may be gained, are open to all' (Rawls, 1958, p. 165). This essentially means that individuals should have equal opportunities to pursue their interests. According to these principles of justice, derived from Rawls' fairness criterion, *state2* (*S2*) should be chosen over *state1* (*S1*) by everyone, and everyone could choose a preferred surname upon legally marrying.[21]

For impersonality concerns, Harsanyi (1955, p. 1977) applies the impersonality principle or what he calls 'ethical preferences', 'imaginative empathy', or 'similarity postulate'.[22] In particular, we can use his utilitarian criterion assuming *as if* equi-

[21] These principles may be considered as maximin (*maximum minimorum*) solution to social justice, achieved by maximising the welfare of the least well-off individual and chosen by people in their original position (1971, p. 152). Applying the rule utilitarianistically in this case, the welfare of DS^p is to be maximized. Simply, we may say that S_2 is better than S_1 in terms of the egalitarian concern.

[22] According to Harsanyi, interpersonal utility comparisons require the 'similarity postulate' that indicates similarity in our basic psychological reaction to alternatives after making proper allowances for personal differences (1977, pp. 639–641). Although the word 'empathy' is used, it is in imaginative form and not

probability of being born type i in a state S, where $i = DS^p$ or $i = CS^p$ type. Furthermore, Harsanyi assumes a rational choice under uncertainty, where a society/individual preference should satisfy the von Neumann–Morgenstern (vNM) axioms or the equivalent Marschak postulates.[23] Without any loss of generality, we may assume that there are only two types in the aforementioned model depicted in Table 2 – DS^p represents a *retain–retain* couple while CS^p represents a *retain–change* couple – and that societal welfare consists of the sum of welfare of these two types only.[24] The social welfare function of each state can be defined as $W_S = \sum_{i \in T}^{N} \rho_i U_i^T$ where legal state $S \in \{1,2\}$, and individual type $T \in \{DS^p, CS^p\}$ with $\rho_i = Prob(T)$ for individual i. In line with Harsanyi's cardinal−utility postulate, we may assign for now a utility value of $U^{CS} = 1$ for CS^p in both states *S1* and *S2* and for DS^p in the latter state, and of $U^{DS} = 0.5$ for DS^p in *S1* regardless of their choice of marriage, as we have already seen their welfare ordering in Section 3. With an equi-probable 1/2 chance of being type DS^p or CS^p, we have societal welfare of *S1*, $W_1 = 3/4 \cdot W_2$, always being lower than that of *S2*, W_2.

For Suppes (1966), the interpersonal comparison involves a comparison of each combination of type and state. Here, equi-probability applies to being type i in a state S, where i corresponds to type DS^p or CS^p, and being in state S, which corresponds to *S1* or *S2*. Again, we can assume having types DS^p (*retain–retain*) and CS^p (*retain–change*) only.

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equivalent to external preferences discussed earlier. The same argument applies to Suppes' terminology of 'extended sympathy'.

[23] Harsanyi (1955, p. 316) notes that 'an individual's impersonal preferences, if they are rational, must satisfy Marchak's axioms and consequently, must define a cardinal social welfare function equal to the arithmetical mean of the utility of the utilities of all individuals in the society'. He defends his application of vNM stating that 'even though a person's vNM utility function is always estimated in terms of his behaviour under risk and uncertainty, the real purpose of this estimation procedure is to obtain cardinal-utility measures for the relative personal importance he assigns to various economic (and non-economic) alternatives' (1977, p. 643).

[24] Here, it is postulated that ($DSp \rightarrow$ *retain–retain*) and ($CSp \rightarrow$ *retain–change*), which makes the current set consisting of mutually exclusive and exhaustible types. Although one's actual choice may not be coherent with one's political disposition in reality, it does not affect the conclusion of our analysis. As we can see from Table 2, the inclusion of other combination types does not affect the total or average welfare difference between *S1* and *S2*.

The individual's ordering over the set of individual consequences here becomes $(CS^p|S1) \sim (CS^p|S2) \sim (DS^p|S2) \succ (DS^p|S1)$. Thus, an individual is indifferent about being type CS^p in *S1* or in *S2* and being type DS^p in *S2*, and either case is strictly preferred to being type DS^p in *S1*. Here, type DS^p strictly prefers *S2*, while type CS^p is indifferent between two states *S1* and *S2*. Now considering impersonality or 'extended sympathy', the following can be said. A person strictly prefers to be type CS^p in *S2* than to be type DS^p in *S1*, that is, $(CS^p|S2) \succ (DS|S1)$, and regards being type DS^p in *S2* $(DS^p|S2)$ at least as good as being type CS^p in *S1*, that is, $(DS^p|S2) \gtrsim (CS^p|S1)$. Then, we may conclude that *S2* is more just than *S1*.[25]

Thus, based on our welfare model, not only societal welfare may improve in a state in which the law is changed to allow an extra option of DS, but such a societal state is considered fairer when we apply the fairness criteria of Rawls, Harsanyi, and Suppes. Apart from these findings, given that surname is primarily an identifier of an individual and of family heritage, some argue that married surname choice is a matter of personal right, whose choice should be left to individuals rather than society, and as such, the current Japanese law infringes on a fundamental personal right.

5. Empirical models: individual marriage−surname choices

After considering an abstract analytical framework of choice preferences, we now translate it into a more tractable and measurable formulation based on individual choices. One way to assess the magnitude of welfare gain/loss is through the willingness to pay (WTP) for different legal states and surname retention, expressed by the respondents. As is clear from Table 2, inferior welfare occurs only in the *retain–retain* couple case in which both parties want to retain their surnames, and the option is either for one of them

[25] More generally, this can be considered a problem of social ordering of the *i*-th individual defined over the Cartesian product of *S* and *I*, where *S* is the set of social states and *I* is the set of individuals. Such social ordering is established in the form of placing oneself in the position of another, through the notion of 'extended sympathy'. For more discussion and formal proofs, see Suppes (1966) and Sen (1970).

to *marry–change* or for a couple to *not marry–retain* under the current law state, *S1*. While it is known that there are certain people who have to change their surnames upon marriage despite their wish to retain their surnames, it is not known how prevalent and strong such wishes are. By allowing for an additional choice option, *marry–retain with payment*, the expressed payment *WTP-name* is considered to reflect, to a certain extent, the desire to retain the individual's surname.

In considering utility and fairness associated with individual choices, we postulate a hypothetical situation in which an individual reveals his preference to marry and to keep his surname upon marriage when his partner also keeps her own.[26] The individual choices are y_{ij}, where marriage choice i = {0: not marry, 1: marry} and surname choice j = {0: not retain; 1: retain}, and thus, y_{10} = (*marry–change*); y_{11} = (*marry–retain with payment*); and y_{01} = (*not marry–retain*). With high (H) and low (L) relative magnitudes, assume the utility from legal marriage $U^m = m^H$, and m^L otherwise, utility from retaining own surname $U^n = n^H$, and n^L otherwise, where superscript m and n designates marriage and surname, respectively. Note that the cost for an individual to keep her surname upon marriage is reflected in U^n, where such cost may include costs of overcoming the unconventional choice, such as negotiation, social pressure, and family obligation, net of the administrative costs of changing surname, which we treat as a default cost of marriage here.[27,28] An individual's decision-making problem can be expressed as:

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[26] Sen (1979, pp. 551–552) warns against the appropriateness of 'revealed preference' in measuring utility and hence, welfare, namely, 'if utilities are defined entirely in terms of choice, then a person will be seen as maximizing his utility in every feasible choice', and such assertion 'is no more than a tautology'. Indeed, the choice of 'revealed preference' may not reflect individuals' true state of welfare or happiness should such choice be made out of social or family obligation. Unfortunately, we have no way of completely excluding such influence but can only expand the choice set.

[27] Emens (2007) discusses the costs of making unconventional name choice in detail.

[28] In terms of administrative costs, based on our crude estimation considering various administrative procedures required for surname change and the associated opportunity costs, the cost of changing one's surname ranges from JPY 7,137 to JPY 18,210, based on the minimum wage and average full-time wage, respectively. If we multiply these costs by the number of couples married in 2009 (approximately 360,000), the total cost to society becomes JPY 2.6 billion or JPY 6.6 billion.

$$(1)\ y_{ij} = \begin{cases} (y_{10} \mid m^H,\ n^L) \\ (y_{11} \mid m^H,\ n^H) \\ (y_{01} \mid m^L,\ n^H) \end{cases}$$

Ignoring legal preferences, a *fair* type chooses an option that permits his partner to retain her surname (y_{10} or y_{11}), even in the case of his own n^H, while an *unfair* type fails to do so regardless. Incorporating the fairness aspect of the preferred legal state choice discussed above, categorising individuals into CS-proponent, CS^p or DS-proponent, DS^p, we obtain the following type–choice combinations:[29]

$$(2)\ \begin{cases} \mathrm{DS}^p - fair \ \rightarrow\ y_{ij} = \{y_{10}, y_{11}\} \\ \mathrm{CS}^p - fair \rightarrow\ y_{ij} = \{y_{10}\} \\ \mathrm{CS}^p - unfair \ \rightarrow\ y_{ij} = \{y_{01}, y_{11}\} \end{cases}.$$

The probability of observing a choice outcome k is $\Pr(y_{ij} = k \mid m, n) = \Pr(y_{ij} \geq k \mid m, n) - \Pr(y_{ij} \geq k+1 \mid m, n)$, assuming that the choice ordering is $k-1, k, k+1$. Based on these type-choice set, the empirical analysis is conducted through a (1) WTP analysis and a (2) MIMIC analysis, as detailed below.

5.1 Willingness to Pay (WTP) analysis

In our empirical analysis, the magnitude of legal preferences is expressed through the WTP for preferred state S in the form of donation to support their preferred legal state. We regard such WTP for a legal state, *WTP-legal*, that is a public good, as a manifestation of extended sympathy/antipathy toward others' choices. As seen in Section 4, external preferences ought to be excluded from social welfare calculation; however, as indicated by Dworkin (1977/1997), in reality, it is likely that there is certain interdependence between personal and external preferences. Indeed, it may not be discernible whether the *WTP-legal* of type DS^p/CS^p to change/keep the current legal state is for their own

[29] Here, CS^p*–unfair* choices, y_{01} and y_{11}, are considered unfair because the subject is not willing to change his surname despite his preference for a CS, that is, he expects his partner to change her pre-marital surname.

preferences or for enabling/preventing others to choose DS. It is, therefore, considered worthwhile to ascertain the magnitude of *WTP-legal* among pro-CS and pro-DS.

Each of *WTP-name* and *WTP-legal* is given by the following function:

(3) $WTP = u_2\,(m', n', l', c' \mid S_2) - u_1\,(m, n, l, c \mid S_1)$,

where m, n, l, and c are marriage, surname, legal state choice, and cost associated with surname retention, respectively. For an indifferent respondent, $u_2 = u_1$, and $WTP = 0$. WTP in this survey is expressed by choosing a single fee range among 9 to 10 options , ranging from 'less than JPY 1,000' up to 'over JPY 1million'. Defining *WTP** as a latent variable in the range $[-\infty, \infty]$, the probability of a respondent's observed *WTP* falling in a range $\tau_k \leq WTP^* < \tau_{k+1}$ is: [30]

(4) $\Pr(WTP = k) = \Pr(\tau_k \leq WTP^* < \tau_{k+1})$ for $k = 1$ to K.

The lower bound of the expected values of WTP for N respondents is:

(5) $E_{LB}WTP = \sum_{i=1}^{N} \tau_k(i)/N$,

which is calculated and investigated through rank analysis via the Kruskal–Wallis test comparing more than two groups, such as policy preferences, where no normally distributed interval but an ordinal relation is assumed for the dependent variable. In addition, logit and ordered logit is applied with a vector of additional regressors, **x**, in order to elucidate factors that affect the demand for legal state and surname. The probability of observing $WTP = k$ for a given value of **x** is:[31]

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[30] The WTP analysis methods for payment cards showing different ranges of amounts are discussed in Haab and McConnell (2002). We employ categorical WTP ranges, since asking an open-ended question would likely confuse the respondents with too many options. In addition, since we are not interested in measuring their exact WTP, possible anchoring bias is considered less harmful. The notion of latent *WTP** here implies that such *WTP** for different choices, such as DS and CS, can be placed along a continuum of utility range, although WTP for each choice is considered separately here with non-negative values.

[31] The logit model is considered here given the relatively small proportion of respondents who expressed any WTP above zero. Although there are criticisms about using contingent valuation to assess preferences for public goods, as reviewed in Diamond and Hausman (1994), our examination of 'comparative WTP' across different options that are mutually exclusive and collectively exhaustible is not considered vulnerable to most criticisms, unless certain options are systematically more prone to bias than other options. Some possible types of WTP bias are discussed where relevant.

$$(6) \qquad \Pr(WTP = k \mid \mathbf{x}) = \Pr(\tau_k \leq WTP^* < \tau_{k+1} \mid \mathbf{x}) = F(\tau_{k+1} - \mathbf{x}\boldsymbol{\beta}) - F(\tau_k - \mathbf{x}\boldsymbol{\beta}).$$

5.2 Multiple Indicators Multiple Causes ***(MIMIC) analysis***

Given the difficulties of obtaining true WTP, the latent variables *WTP-name** for retaining surname and *WTP-legal** for a preferred legal state are examined in different forms by the MIMIC generalised structural equation model. The model construct is shown in Figure 1; two latent variables *Attachment* and *Fairness*, determined exogenously in the structural part, are manifested through several indicators in the measurement part.

[Insert Figure 1 around here]

A latent variable, *Attachment*, is designed to reflect attachment to an individual's pre-marital surname, indicating *WTP-name** or utility of retaining surname.[32] If *Attachment* is found to be positive and significant for married surname decisions, this would suggest that allowing DS would likely increase welfare by enabling individuals to make surname decisions coherent with their attachment. *Attachment* is manifested through the following four response ordinal indicators, from less attached to more attached: (1) surname preference (q6); (2) opinion on surname representation (q1); (3) feelings about surname change (q4); and (4) opinion on the visit to one's ancestral grave (q12), as detailed in Table 3. The model encompasses another latent variable, *Fairness*, whose positive/ negative coefficient indicates *WTP-legal** or utility for a revised/current legal state. Like *Attachment*, it is expressed through three response indicator variables that are considered to reflect fairness or extended sympathy, in the order of less fair to fairer: (1) legal preference (q5); (2) views on the inconvenience of using an alia (q2); and (3) surname preference (q6).[33] In addition, a categorical marriage−surname choice in the hypothetical

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[32] The MIMIC model is an extension of the standard item response theory model which extracts information through covariances. See Muthén (1988).

[33] The appropriateness of ordering is checked a posteriori via correlation coefficients and graphical examination. While all ordinal variables, q2, q5, and q6, exhibit coherence with *Fairness* and q4 and q6 exhibit coherence with *Attachment*, q1 and q12 exhibit no clear ordinal relationship with *Attachment*. See Appendix II.

situation in which the respondent faces a name−retaining partner is applied to indicate either *Attachment* or *Fairness*, where choices are, *marry–change surname*, *not marry–retain surname*, and *marry–retain surname with payment*, plus *unsure* (q7). In the structural part, both latent variables are determined by a range of sociodemographic factors, such as gender, age, education, marital status, income, and city size; furthermore, the number of visits to one's ancestral grave in the past year is included as a determinant of *Attachment*.

Let $\mathbf{y}$ be a vector of response indicator variables that can be dichotomous, ordinal, or multinomial, $\boldsymbol{\eta}$ be a vector of latent variables assumed to be continuous, $\boldsymbol{\nu}$ and $\boldsymbol{\lambda}$ be intercept and slope measurement parameters, where the intercept is applicable only in the multinomial case, and $\boldsymbol{\varepsilon}$ be the vector of measurement errors. The measurement part of the structural model for individual *i* is expressed as

(7) $\mathbf{y_i} = \boldsymbol{\nu_i} + \boldsymbol{\lambda_i}\boldsymbol{\eta_i} + \boldsymbol{\varepsilon_i}$,

and the latent construct follows the linear structural equation system with a vector of sociodemographic factors $\mathbf{x_i}$ as regressors:

(8) $\boldsymbol{\eta_i} = \boldsymbol{\gamma_i}\,\mathbf{x}_i + \zeta_i$,

which produces the following reduced-form solution for $\mathbf{y}$:

(9) $\mathbf{y_i} = \boldsymbol{\nu_i} + \boldsymbol{\lambda_i}\boldsymbol{\gamma_i}\,\mathbf{x_i} + \boldsymbol{\lambda_i}\zeta_i + \varepsilon_i$,

where $\boldsymbol{\lambda}$ and $\boldsymbol{\gamma}$ form vectors of coefficients, and ε and ζ are well-behaved residuals assuming normality. Here, it is assumed that personal characteristics $\mathbf{x_i}$ determine the latent variable $\boldsymbol{\eta_i}$, and the response item $\mathbf{y_i}$ will covariate according to the $\boldsymbol{\eta_i}$'s variations.

6. Data

For empirical analysis, we use a set of primary data collected through the internet/web−based surveys because relevant public opinion survey data on the DS system collected by the Japan Office of Public Relations in 1996, 2001, and 2006, are

available only in aggregate form.[34] The web survey *(MainWeb2009)* conducted in December 2009 comprises 13 questions and several sub-questions on the topic with an additional 10 basic sociodemographic questions. Like most web−based surveys in Japan, this survey uses registered web users cum consumers who can earn shopping/reward points by completing the survey questionnaire.[35] In order to adjust the skewed gender–age distributions typical of internet survey respondents with a higher representation of those aged 30–40 years, we utilise a stratified random sampling by applying a proportional allocation based on the gender–age strata in the population.[36] In addition, the number of survey request emails sent to randomly selected respondents was controlled at the state/prefecture level in order to reflect the regional population distribution. The email recipients decide whether to visit the survey website to respond to the questionnaire. Out of 12,985 requests sent, 2,746 (21.14%) accessed the survey site and 2,124 (16.35%) completed surveys within 4 days. The effective sample size was reduced to 2,000 after data cleaning. The average and median response time was 7'02" and 5'40", respectively.[37] Descriptive statistics are given in Table 3.

[Insert Table 3 around here]

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[34] Any original disaggregated data of any survey conducted by the Japan Office of Public Relations are discarded after the production of its report, which provides only aggregated results, and thus, are unavailable even for academic purposes (personal communication with ministry staff). There were five other preceding surveys on DS in 1976, 1984, 1987, 1990, and 1994, although the earlier studies had no legal amendment to permit DS but focused more on the use of alias. It is only since the 2006 survey that DS and alias are distinguished. The latest survey was conducted in 2012.

[35] The questionnaire used the POTORA site managed by NTT-Navispace. The registered users, called 'monitors', have to register their personal details, and their record undergoes a regular personal identification validity check. The monitor characteristics are highly similar to any other web-based survey monitor panels, with a larger representation of those living in major cities and those aged 30–40 years.

[36] While there is a concern for measurement error and selection bias by using a stratified random sampling method, this method is considered to generate less bias compared to complete random sampling with posteriori weight application. For instance, we could have applied weights for each variable for the analysis according to the population distribution. However, this posteriori method is considered to produce a higher magnitude of bias, especially if there is very low representation of certain groups with particular characteristics.

[37] Respondents who took too short a time to complete the questionnaire were judged 'non-serious' and were removed from the effective sample, together with obvious contradictory responses.

This web survey is partly supplemented by another web survey that was a trial survey carried out a few months earlier, in October 2009, with four topic−related questions and three basic personal information questions *(TrialWeb2009)*. The survey requests were sent to randomly selected research monitors, yet without any stratification, and 2,279 replies were collected.[38]

While there are studies questioning the validity of web−based surveys (Honda & Motokawa, 2005), others support its validity and effectiveness (Koch and Emrey, 2001; Hudson et al., 2004; Lensvelt-Mulders et al., 2006). In order to compare the web and government surveys, we deliberately include several of the same questions in the web surveys. Comparing them, there are similarities and discrepancies among the survey responses, and no clear conclusion regarding the survey method superiority could be reached. There seems to be no specific type of trend or bias across all questions, yet there are certain comparative characteristics. First, older generations tend to be more conservative, in the sense that they have more negative views regarding the DS system, explicitly or implicitly. This tendency is seen particularly for the government surveys, which have disproportionately higher ratios of senior respondents aged 60+ years. On the contrary, the younger respondents in the government surveys tend to be more 'liberal' or 'non-traditional' in accepting the DS system than their web-survey counterparts. It is worth noting that the summary results of government surveys are misleading in that neither the disproportionate age representation nor the respondents' localities are adjusted a posteriori. Another noteworthy point is that *TrialWeb2009* responses are relatively more liberal, even after adjusting for their disproportionately higher ratio of younger

[38] This survey was administered as a trial survey by Cross Marketing Inc., one of the largest survey companies in Japan, which has high quality-control measures. Because of the complete random sampling method, gender–age sampling weights are applied. Age categories are in 5-year intervals and respondents' ages vary between 18 and 69 years.

generations.[39] Descriptive statistics are given in Table 3 and a list of questions and response options are provided in Appendix I.

[Insert Table 3 around here]

7. Overview of the current Japanese situation and surname perceptions

Out of the total sample of 2,000, there are 655 men and 824 women who have been married, including divorced and widowed respondents. Of those who changed their surnames, women constitute 95%, which is lower but close to the official figure of 96% reported by the government (MHLW, 2017). About 30% of men and 17% of women who have changed their surnames have used alias thereafter, suggesting inconvenience in the workplace associated with surname change.

For opinions regarding surname (q1), respondents were allowed multiple responses with three main response options, *ancestry*, *oneself*, and *couple,* and the major response is *ancestry*, chosen by 31.8% of respondents as a sole option, and 66.1% in combination with other options. While this suggests significance of surname lineage, a higher proportion of men choosing this response is likely to reflect the fact that women commonly have to abandon their surnames upon marriage. Likewise, a higher ratio of men connect their surnames with *oneself as an individual* (*distinguishing oneself from others*), while a higher ratio of women associate surname with *couple* (*name that represents family, with the husband and wife at its core*). Nonetheless, the *oneself* response is reduced for married men by 7.7% and increased for married women by 2.9%. A Pearson-χ^2 test of equal distribution suggests similarities between single men and women and dissimilarities between married men and women in the opinions.

For preferences regarding the proposed legal amendment (q5), the most popular opinion is *pro-DS*, accounting for 38.8% of responses, followed by *pro-alias*, accounting for

28.4%, and by *pro-CS*, accounting for 25.3% (Table 3 Panel B). The remaining respondents replied *other* or *uncertain*. Regarding gender−wise response ratios, women are more agreeable to the legal change, and less agreeable to keeping the current state, with the distributional difference statistically significant at the 0.000 level. In addition, there are statistically significant differences for the responses across age–gender groups, where the highest proportion of *pro-DS* is for female respondents in their 20s and 40s, the highest proportion of *pro-alias* is for female respondents in their 30s and 50s, and the highest proportion of *pro-CS* is for male respondents in their 60s and 50s.

Regarding the type of surname respondents wish to have (q6), 55.6% prefer to have CS and 11.4% prefer to have DS. Of those wishing to have DS, we observe nearly twice as high a ratio of women to men, 14.8% to 7.8%, respectively. A multinomial logit analysis shows that women are more likely to want DS rather than CS compared to men with a relative risk ratio of 1.97, at a *p*-value of 0.000. At the same time, 33% of the respondents of either gender remain unsure about their preference, indicating possible flexibility of views or indifference. Of the *pro-DS*, 20.5% (male: 14.1%; female: 26%) wish to have DS, while 39.2% (male: 37.8%; female: 40.5%) do not wish to have DS and 40.3% are unsure about their surname choice, of whom half are currently married. The observation that the majority of those *pro-DS* who are agreeable to the law change do not choose DS for themselves matches the actual situations in other countries, where DS is already available. This fact also supports the use of two latent variables, *Fairness*, which reflects extended sympathy, and *Attachment*, which reflects own utility.

Regarding whose surname to take, among those respondents who prefer to have CS (q6_1), a striking gender difference prevails, in which men expect to take their *own* surname while women expect to take their *spouse's* surname. Of those who reply wishing to have a CS as a married couple, 95.3% of the *own* responses are men. On the other hand, 97.4% of *spouse's* responses are chosen by women. The results reflect the current social practice of almost always adopting a husband's surname as a CS. Nonetheless, single men

are less salient in this tendency and are more likely to reply *spouse's* or *either*. This statistically significant difference may suggest perceptive evolution and/or naïveté. Cross-tabulating the CS preference (q6_1) and legal state preference (q5) across gender, a majority of men choose *own* and a majority of women choose *spouse* regardless of legal preferences, although this tendency is particularly high for *pro-CS* with statistical significance. Among those women who are *pro-CS*, there are only few *own* responses: 15 (2.8%) out of 534. While the ratio of *either* is higher for *pro-DS* and *pro-alias*, such tendency is observed particularly for women, with gender difference being statistically significant at the 1% level.

8. Estimation results

The magnitude of welfare gain/loss is examined through WTP expressed by the respondents. The *WTP-name* for surname retention indicates the utility gain from allowing DS. The *WTP-legal* for supporting a preferred legal state indicates extended sympathy or external utility towards the CS, alias, or DS system, while that for sustaining current state indicates extended antipathy or external disutility against the revised legal system.

8.1 WTP-name for retaining surname

For the marriage–surname choice in the hypothetical situation facing a surname-retaining partner, the majority prefer *marry–change* (y_{10}), the second major response is *uncertain*, followed by *marry–retain with payment* (y_{11}) and *not marry–retain* (y_{01}), for both datasets, as shown in Table 3 (Panel B q7). Although no table is shown here, there is a higher proportion of women choosing *marry–change* while nearly double the proportion of men choose *marry–retain with payment*. The majority of those who choose *not marry–retain* are male respondents whose choice suggests that the utility of retaining the surname is larger than that of getting legally married, $U^n > U^m$, a case that currently leads to de facto marriage. However, this option is avoided by the majority, regardless of legal-state

preference, indicating that $U^m > U^n$ for most respondents. On fairness, 72.2% of anti-revisionist *pro-CS* men wish to keep their names as married surnames, and among those, 24.5% responded that they would not change their own surname in the hypothetical situation, choosing *marry–retain with payment* or *not marry* options. This implies that these men wish to have CS while being resolute in keeping their own surnames, failing to meet the fairness criteria.

The sub-question asking about the *WTP to retain own surname* (q7_1) applies only to those who replied *marry–retain with payment* in q7. Not surprisingly given current practice, nearly twice as many males express positive *WTP-name* compared to women in both data sets: 105 males versus 60 women in *MainWeb2009* and 80 men versus 48 women in *TrialWeb2009*. The major and median categories are the lowest *<JPY 5,000* (approximately US$ 55 as of December 2009) for both genders in *MainWeb2009*, and *JPY 10,000* ≤ ~ < *JPY 30,000* for men and *JP Y5,000* ≤ ~ < *JPY 10,000* for women in *TrialWeb2009*. The differences between the two surveys may be due to the way in which the question was formed: *MainWeb2009* specified the payee to be a public administration office, while *TrialWeb2009* did not specify any payee but asked the question in a general manner. Although the respondents are not asked for their reasons for *no WTP*, they may well feel it unjust or unfair to have to pay the public administration if they consider that surname choice is a basic individual right, which could result in a 'protest−zero' response in which zero value is stated despite their genuine positive demand for the good.[40]

Analysing the lower band of expected *WTP-name* for surname across three legal policy−preference groups and across gender, shown in Table 4 Panle A, *pro-DS* all, men and women have the highest values, apart from *pro-alias* men in *TrialWeb2009*. The expected *WTP-name* is statistically different between genders in all cases except for (4)

[40] A study by Whitehead (2006) on the WTP for a special fishing permit allowing holders to retain the present quota found the major reason for zero WTP in the CVM method was that respondents fundamentally disagreed with the policy and perceived such policy as unfair.

for *TrialWeb2009*, which is significant only at the 0.10 level. Likewise in Panel B, the difference across surname preference (whether one wishes to have a DS or CS) and across gender is highly significant, where *want-DS* have the highest values by large margins in all cases, but *want-CS* men in *TrialWeb2009*. A non-parametric analysis of rank, applying the Kruskal−Wallis test, reveals significant statistical differences for *WTP-name* across the legal state preferences and surname preferences in both surveys, regardless of sub-categorisation by gender.[41]

[Insert Table 4 around here]

As shown in Table 5 *WTP-name* (Panel A), all logit estimations find *pro-DS* to have odds ratio of more than 2 including estimation (3) with only male subsample, and nearly 4 when interacted with *male*, at the 0.001 significance level vis-à-vis their base categories *pro-alias. Male* is found to have odds ratio of over 2 in estimates (1) and (4). It is worth noting that *pro-CS* interacted with *male* also has odds ratio of over 2, indicating surname attachment amongst *pro-CS* men. Surname preference *want-DS* has statistically significant and high odds ratio of around 4 for all estimations, except for that of 2.6 for male only estimation. Another variable of statistical significance is *education*, with positive effects. Thus, we see that having legal preference of *pro-DS*, wishing for DS, being male, and/or having more education makes the individual significantly more likely to be willing to pay for retaining his/her surname, holding other factors constant.

[Insert Table 5 around here]

8.2 WTP-legal for preferred legal state

[41] In terms of preferred legal state, positive *WTP-name* is observed most frequently among *pro-DS* regardless of gender, with a particularly high proportion among women (66%). Within the *pro-CS* group, less than 1% of women (two) express *WTP-name* in *MainWeb2009* and none do so in *TrialWeb2009*, while there are 8.6% and 9% of their male counterparts, respectively. Fisher's exact test, suggests statistically significant gender differences in all cases except *pro-alias* and *want-DS* in *MainWeb2009*, and *pro-DS* in *TrialWeb2009.*

While q5 suggests how people think about the current state of law, the follow-up question q5_1 elucidates how strongly people feel about it through their WTP to support a preferred legal state. The majority report having no WTP regardless of legal options in either *MainWeb2009* or *TrialWeb2009*. There are relatively few who expressed *WTP-legal*: 3% of respondents for *MainWeb2009* and 9% for *TrialWeb2009*. In both surveys, there may be cases of *no WTP-legal* due to disincentives for giving money to promote a certain policy that is typically a public good, or due to 'protest−zero'. Despite these probable interpretations, the very few positive *WTP-legal* to support their preferred legal policy state suggests a small magnitude of external utility at the societal level.

The largest group to express positive *WTP-legal* is *pro-DS* in both surveys—5.1% and 11.6% in the main and trial surveys, respectively. The ratio of *WTP-legal* response is similar across genders for *pro-DS*, while for *pro-CS*, two to three times as many men expressed their *WTP-legal* compared to women in both datasets, indicating 'strong' opposition to the DS system from *pro-CS* men ('strong' here means 'with some positive *WTP-legal*'). This tendency is supported by the logit and ordered logit estimates in Table 5 *WTP-legal* (Panel B) that while *pro-CS* interacted with *male* has the highest odds ratio of nearly 6 in estimation (7) and (10), *pro-CS* without male interaction is not statistically significant in other estimations. On the other hand, *pro-DS* coefficients are found to be statistically significant with high odds ratio with/without *male* interaction.

The chosen *WTP-legal* amount ranges, which are collected only in *MainWeb2009*, are relatively low (less than JPY 1000 ≈ US$ 11) in most cases. At the same time, we observe respondents expressing their WTP of non-trivial amounts. As shown in Panel A of Table 6, there is a significant difference between men and women in terms of the lower band of expected *WTP-legal* by the legal policy type; while the *pro-CS* type has the highest value among men, the *pro-DS* type has the highest value among women.[42] Despite the fact that

[42] While Pearson-χ^2 suggests a statistically significant difference in *WTP-legal* across the three legal preference groups only at the 0.10 level, the non-parametric Kruskal–Wallis test suggests a statistically

hypothetical *WTP-legal* may not necessarily reflect respondents' true external utility, the observation exhibits gender disparity, particularly among those who prefer the current CS institution. With regard to surname preference, as shown in Panel B of Table 6, there is a statistically significant difference, where *want-DS* men and women both express higher values by large margins compared to *want-CS* and *uncertain* groups.[43] Although there is little positive *WTP-legal*, the results indicate that societal individual average welfare is expected to increase if the law is revised, despite the magnitude of external utility being relatively small for the society. In addition, it is suggested that legal preferences are less likely to be external preferences for those who want DS.

[Insert Table 6 around here]

8.3 MIMIC estimation results of attachment and fairness

The results of the structural equation analysis with the MIMIC model shown in Table 7 contain coefficients for six estimations (1)~(6) with varying variable inclusion for all samples and subsample estimations (7) for male and (8) for female. The first part (Panel A) shows the measurement and the second part (Panel B) shows the structural estimations as specified in Figure 1, followed by the goodness-of-fit statistics. The latent variables *Fairness* and *Attachment* are both designed to have positive measures, and each respondent's attribute x_i is allowed to have different degrees of fairness and attachment to surname. The following discussion, pertaining primarily to all sample estimation, with some remarks on subsample estimation, concentrates on the results of marriage-surname choice (q7) in the measurement part.

A brief look at the structural part of *Fairness* in Panel B first, statistically significant robust results suggest that those who are female, are divorced, have more years of

significant difference at the 0.01 level.

[43] The Kruskal–Wallis test of equality of distribution indicates statistically significant differences across the groups. Fisher's exact test, applied to test for equality of proportions in small samples, shows statistically significant gender differences in all *WTP-legal* among the *want-CS* respondents.

education and/or live in large cities, or those who are single male, are more likely to have higher degrees of *Fairness*. For *Attachment*, there is no clear gender difference, while both *single* and *divorced*, as well as *income* have statistically significant robust positive coefficients. Turning to the measurement part in Panel A, each estimation model has a slightly different construct particularly for the estimation of surname–marriage response indicators (q7). While models (1)–(3) and (8)–(9) for subsamples have the usual MIMIC structure, models (4)–(7) have extra categorical variables, *legal preference* (q5) and/or *surname preference* (q6) in place of latent variables in order to observe their particular effects.[44] For each latent variable, one response variable is constrained to 1, which is the *alias opinion* (q2) for *Fairness*, and *surname opinion* (q1) for *Attachment*, with each organised as an ordinal indicator.

[Insert Table 7 around here]

Finally, we inspect the categorical *marriage–surname* choice (q7) indicators, with *uncertain* as the base outcome. Faced with a surname−retaining partner, those who choose *marry−change* (y_{10}) (1.q7), loadings of *Fairness* are found to be positive and statistically significant in all four estimations as well as in male subsample estimation (8). On the other hand, those of *Attachment* are found to be negative and significant in all five estimations and two subsample estimations with high magnitudes, which is a reasonable finding since they are agreeable to change their surname. When legal preference (q5) is included instead of *Fairness* in estimation (4), all legal preference types of *pro-CS*, *pro-alias*, and *pro-DS* have positive loadings vis−à−vis *uncertain*, understandably, as most respondents choose to change their surnames in the hypothetical situation. On the other hand, legal preference (q5) interacted with *male* included in estimation (5) exhibits statistically significant negative coefficients for *pro-CS* and *pro-alias*. Regarding surname preference (q6) included instead of *Attachment* in model (6), *want-CS* has significant

[44] As aforementioned and specified in Figure 1, surname preference is considered to manifest one's fairness and surname attachment, and the result is robust to the inclusion of either latent variable.

positive loading vis−à−vis *uncertain*, although *want-CS* interacted with *male* in model (7) displays significant negative loading. These results suggest that *pro-CS*, *pro-alias* and *want-CS* men are unwilling to change their own surname despite their CS preference. Indeed, *sex* dummy for *male* included in models (2), (4) and (6) has statistically significant negative coefficients of around −0.57~−0.77, although those effects must be calculated as −0.64~−0.66 by offsetting with a statistically significant negative *Fairness* multiplied by their negative coefficients for male in the structural part estimating *Fairness*. Such negative loadings confirm our earlier finding that men are less willing to change their surnames despite their preference for CS.

Turning to *marry-retain surname with payment* (y_{11}) (2.q7), loadings of *Fairness* are found to be positive and significant in all six estimations including those of subsamples with higher magnitudes of around 0.9~1.2, while *Attachment* exhibits opposite loading signs with or without statistical significance. As expected, *male* has significant positive loadings of 0.64 and 0.74 in models (2) and (6), respectively, although it should be offset to 0.23 and 0.42, respectively, given significant latent variables. Regarding legal preference in model (4), all types have positive and high loadings in the range of 3.3 to 4.0 at the 0.001 significance level. While it is a reasonable finding for *pro-DS*, it also indicates that *pro-CS* and *pro-alias* types are willing to pay to retain their surnames despite their legal preference opposing DS allowance. The magnitude of loadings is in the order of *pro-DS* > *pro-CS* > *pro-alias*, which is coherent with the findings of the *WTP-name* analysis. The results are similar with slightly less magnitudes for male subsample estimation (results not shown). Among the estimates with *male* interaction in model (5), only *pro-DS* is statistically significant with positive loadings. Regarding surname preference in model (6), *want-DS* and *want-CS* both have statistically significant positive loadings over 1, although *want-CS* is significant only at the 10% level when interacted with *male* in model (7).

The third category, *not marry−retain* (y_{01}) (3.q7), is distinctive in having significant negative *Fairness* loadings in all four estimations plus male subsample estimation, indicating it to be an unfair choice that female, single/divorced, educated, and large city inhabitants are less likely to choose. The non-significance of *Attachment* across models suggests that those who choose *not marry* and retain surnames may do so for reasons other than surname attachment. *Male* has highly significant positive loadings for this choice, even after offsetting the effects through the latent constructs. In terms of legal preference in estimation (4) and (5) with *male* interaction, only *pro-CS* is statistically significant with loadings of 2.22 and 2.39, respectively. This is coherent with our earlier findings. Regarding surname preference, statistically significant loadings are 2.36 for *want-CS* and 2.94 for *want-DS*, respectively in model (6), and 3.48 for *want-CS* with *male* interaction in model (7).

The results for the last two choices , *marry-retain surname with payment* (2.q7) and *not marry−retain* (3.q7), suggest that even though *pro-CS* oppose the legal change and *want-CS* want to have common married surnames, they are unwilling to take on their partners' surnames, and would rather avoid doing so by paying or not marrying. Given that these two choices are more likely to be taken by males, it is deduced that *pro-CS* and/or *want-CS* men oppose the legal change, because they do not consider themselves the subject of surname change, and thus, fail to put themselves in the shoes of others.

9. Conclusions

We reviewed the current situation in Japan regarding married surnames, especially the legal situation, and arguments for and against the introduction of a selective dual surname system. Based on our analytical framework, it was found that the proposed legal change improves societal welfare, disregarding the external preferences of anti-revisionists. External preferences, analysed from the perspectives of Bentham, Mill, and Dworkin, elucidated the issue of justifiable composition of social welfare, leading to the discussion

on fairness. Based on the fairness criteria of Rawls, Harsanyi, and Suppes, conceptualised as ‘putting oneself in others’ shoes’, the revised legal state was shown to be chosen by everyone as a fairer state.

The empirical assessment of welfare improvement by surname retention and that of fairness was conducted through parametric and non-parametric willingness to pay analysis as well as generalised structural equation analysis applying the MIMIC model. The analytical framework and methodology used here offer a completely novel approach, and may be applied to other social issues that involve intangible notions.

The willingness to pay for surname retention revealed that men, regardless of their legal preference, were significantly more likely to have positive figures on average, although women wishing for dual surname had a higher likelihood of willing to pay and retain their surnames compared to their men counterparts. Indeed, the MIMIC analysis suggested that a dual surname option can increase the welfare of those attached to their surnames. In contrast, the willingness to pay for preferred legal policy was nil for the majority, indicating that incentive to support a preferred legal policy is generally small. Still, the highest expected willingness to pay was expressed by the pro-revisionist and those who wanted dual surname, suggesting inseparable internal and external preferences and possibility of societal welfare gain if the law were revised. A striking gender difference among the anti-revisionist and those who want common surname suggested stronger opposition to the legal revision originating especially from men.

For the marriage–surname choice in a hypothetical situation in the MIMIC analysis, those who chose not to marry in order to retain their surname were shown to be ‘unfair’. The fact that this choice as well as that to marry but retain their surname with payment were made by male anti-revisionists signified that they failed to meet the fairness criteria; they oppose the legal change and want common surname, yet they would not change their own surname even when their partners have to retain theirs. Thus, those men reckoned that their female counterparts were to change their surnames regardless of the situation.

In general, the majority of people supported legal revision to allow dual surname, although there were still those opposed to the revision. Gender disparities were evident in that women, typically in the position to change their own surnames, were more agreeable to the legal revision. For surname choice, the majority of men expected to take their own surname and the majority of women expected to take their spouses' surname. Although we observed a possible sign of perceptive evolution toward a more neutral choice of surname among younger generations, many of those who were agreeable to the legal revision actually did not wish to have dual surname themselves or remained unsure about it. Thus, the proposed revision is most likely to result in greater options rather than a radical change in the social institution or family values, which the opponents fear. This seems to be in line with the observations from other countries we have seen above. From both the welfare and fairness perspectives, the legislative amendment allowing the selective dual surname system should be pursued. The fact that anti-revisionist arguments dominate current government decision making may denote skewed parliamentary representation on this matter.

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Table 1. Opinions for and against the legal amendment regarding selective dual surname (ds) system

Pro-Dual Surname (revisionist)	Anti-Dual Surname (anti-revisionist)
The current law	The revised law
• restricts and possibly harms professional achievement of those who are required to change their surnames • inflicts emotional distress on those who are required to change their surnames as they feel forcefully incorporated into their spouse's family • is inegalitarian, since the majority of those who are required to change their surnames are women • is costly and requires efforts to change surname, e.g. changing bank accounts, credit cards, driver's license • forces de facto couples to endure disadvantages in terms of taxation and social credit • does not reflect the changes in public awareness regarding the social institution of marriage	• allows different surnames which would harm family ties and result in a dysfunctional family • is a threat to the current system, which is a part of Japanese culture and tradition • creates a problem in determining the surnames of children • may lead to a situation in which the children of families with different surnames are bullied

Table 2. Choice-sets and welfare of a couple wishing to get married

		Couple Surname Preference Types				
State	Choice	*Retain–Retain*	*Retain–Change*	*Retain–Indifferent*	*Indifferent–Change*	*Indifferent–Indifferent*
S*tate1*:	Marry	W^{HH}(m1, n1), W^{HL}(m1, n0)	W^{HH}(m1, n1), W^{HH}(m1, n0)	W^{HH}(m1, n1), W^{HH}(m1, n0)	W^{HH}(m1, n1), W^{HH}(m1, n0)	W^{HH}(m1, n1), W^{HH}(m1, n0)
Current law	Not marry	W^{LH} (m0, n1), W^{LH} (m0, n1)	-	-	-	-
State2:	Marry	W^{HH} (m1, n1), W^{HH}(m1, n1)	W^{HH}(m1, n1), W^{HH}(m1, n0)	W^{HH}(m1, n1), W^{HH}(m1, n1,0)	W^{HH}(m1, n1,0), W^{HH}(m1, n0)	W^{HH} (m1, n1,0), W^{HH} (m1, n1,0)
Revised law	Not marry	-	-	-	-	-

Notes: *m1* = exercise the right to legal marriage; *m0* = relinquish the right to legal marriage; *n1* = exercise the right to keep one's surname; *n0* = relinquish the right to keep one's surname; W^{ij} indicates welfare from marriage (*i*) and surname (*j*) choices, where superscripts *i,j=H*, *L* indicate high welfare and low welfare, respectively.

Table 3. Descriptive statistics (A) and frequencies (B and C)

Panel A: Numerical and Ordinal Variables[a]

Variable	Mean	SD	Min	Max	Variable	Mean	SD	Min	Max
q1_surname_opinion	3.36	0.89	1	4	q12_gravevisit_view	2.70	0.56	1	3
q2_alias_opinion	2.81	1.18	1	4	sex	1.52	0.50	1	2
q4_ change_feeling	2.11	1.23	1	4	age	49.25	14.72	20	86
q5_legal_preference	2.82	1.20	1	4	education year	13.75	2.15	6	18
q6_surname_prefer.	1.56	0.69	1	3	marital status	1.86	0.65	1	4
q7_marriage–surname	1.81	1.25	1	4	income_self	4.39	4.39	0.5	15
q11_num_gravevisit	1.92	2.24	0	9	city size	2.18	1.30	1	4

Panel B: Fairness and Attachment Related Ordinal/Categorical Variables[b]

	Freq.	Percent		Freq.	Percent
Fairness			***Attachment***		
q2_alias_opinion			q1_surname_opinion		
1. no_inconvenience	498	24.9	1. couple	225	11.25
2. uncertain	112	5.6	2. couple & self/ancestry	495	24.75
3. too_bad	663	33.15	3. self/ancestry	1,166	58.3
4. better_not	727	36.35	4. uncertain/other	114	5.7
q5_legal_preference			q4_surname_change_feeling		
1. pro-CS (common surname)	505	25.25	1. united/newlife	999	49.95
2. uncertain	130	6.50	2. mixed	215	10.75
3. pro-alias	567	28.35	3. no_feel/uncertain	362	18.1
4. pro-DS (dual surname)	775	38.75	4. strange/selfloss	424	21.2
- other	23	1.15	q6_surname_preference		
Fairness/Attachment			1. common surname (CS)	1,111	55.55
q7_marriage–surname			2. uncertain	661	33.05
1. marry–change	1,329	66.45	3. dual surname (DS)	228	11.4
2. marry-retain with payment	169	8.45	q12_gravevisit_view		
3. not marry–retain	54	2.7	1. no_need/no_want	109	5.45
			2. neither/uncertain	376	18.8
			3. need/want	1,515	75.75

Panel C: Personal Information Related Ordinal/Categorical Variables[b]

	Freq.	Percent		Freq.	Percent
sex			city size[c]		
a. male	964	48.2	1. others	1,010	50.5
b. female	1,036	51.8	2. special	156	7.8
marital status			3. medium	302	15.1
a. single	521	26.05	4. large	532	26.6
b. married	1,298	64.9			
c. divorced	118	5.9			
d. widow	63	3.15			

Notes: (a) Ordinal variable mean and SD values in panel A are calculated by treating ordering expressed in panel B as numerical values for descriptive purpose; (b) Ordered variables are itemised by numbers and categorical variables are itemised by alphabets. Ordering of q2, q5 and q7 is from less fair to fairer, and that of q1, q4, q6, q7 and q12 is from less attachment to more attachment, as explained in the main text section 5.2; (b) city size categorisation is based on it legal population as of 2009: large city (*daito-shi*) ≥ 500,000, medium city (*chuukaku-shi*) ≥ 300,000, special city (*tokurei-shi*) ≥ 200,000, others < 200,000; n=2000; SD is standard deviation.
Data Source: MainWeb2009.

Table 4. Lower bound of expected willingness-to-pay for surname retention ($E_{LB}WTP^n$) and rank analysis by legal preference (q5) and surname preference (q6) across gender

	male			female			all		
	CS^p	DS^p	AL^p	CS^p	DS^p	AL^p	CS^p	DS^p	AL^p
Panel A: WTP-name by legal preference (q5)									
	(1)						(2)		
$E_{LB}WTP^n$	583.09	873.34	516.56	71.77	416.72	215.41	365.88	1012.98	343.94
rank sum	280657	388101	236604	192571	425608	311124	473228	813708	547727
N[(a)]	23/ 283	65 / 355	16 / 242	2 / 209	43 / 420	15 / 325	25 / 492	108 / 775	31 / 567
P(WTP>0)	0.081	0.183	0.066	0.010	0.102	0.046	0.051	0.139	0.055
	(3)						(4)		
$E_{LB}WTP$	2489.5	3230.6	3910.2	0.0	870.6	318.9	1567.6	1899.5	1930.4
rank sum	329722	477868	281436	177187	613491	325037	506909	1090000	606472
N[(a)]	25 / 284	36 / 412	19 / 245	0 / 167	43 / 533	5 / 301	25 / 451	79 / 945	24 / 546
P(WTP>0)	0.088	0.087	0.077	-	0.081	0.017	0.055	0.084	0.044
Panel B: WTP-name by surname preference (q6)									
	male			female			all		
	want-CS	want-DS	uncertain	want-CS	want-DS	uncertain	want-CS	want-DS	uncertain
	(5)						(6)		
$E_{LB}WTP^n$	924.96	1323.71	306.18	70.80	2271.20	62.93	490.58	2279.20	189.16
Rank sum	551502	80708.5	344292	522127	171078	305372	1070000	251787	649663
N[(a)]	54 / 546	19 / 68	32 / 343	7 / 565	37 / 147	16 / 318	61 / 1111	56 / 215	48 / 661
P(WTP>0)	0.099	0.279	0.093	0.012	0.252	0.050	0.055	0.261	0.073
	(7)						(8)		
$E_{LB}WTP$	3989.0	2891.3	773.4	59.7	3112.7	194.1	2192.0	3025.7	471.1
rank sum	740662	108886	451058	575369	188699	478967	1320000	297585	930025
N[(a)]	58 / 636	10 / 92	18 / 406	6 / 536	34/ 142	8 / 443	64 / 1172	44 / 234	26 / 849
P(WTP>0)	0.091	0.109	0.044	0.011	0.239	0.018	0.055	0.188	0.031

Notes: (a) N for positive WTP and N for all observations; 13 and 24 incoherent cases (*pro-CS* & *want-DS*) are excluded for *MainWeb2009* and *TrialWeb2009*, respectively.

Pearson χ^2 for $E_{LB}WTP$: (1) χ^2=100.711 (54df), pr=0.000; (2) χ^2=66.428 (24df), pr=0.000; (3) χ^2=84.478 (63df), pr=0.037; (4) χ^2= 37.796 (27df), pr=0.081; (5) χ^2=176.012 (30df), pr=0.000; (6) χ^2=121.072 (12df), pr=0.000; (7) χ^2=181.078, pr=0.000; (8) χ^2=102.806 (18df), p=0.000.

Kruskal–Wallis χ^2 with ties for rank $\boldsymbol{WTP^n}$: (1) χ^2=81.708 (9df), pr=0.0001; (2) χ^2=56.659 (4df), pr=0.0001; (3) χ^2=46.301 (7df), pr=0.0001; (4) χ^2=20.982 (3df), pr=0.0001; (5) χ^2=133.543 (5df), pr=0.0001; (6) χ^2=101.847 (2df), pr=0.0001; (7) χ^2=134.135 (5df), pr=0.0001; (8) χ^2=81.001 (2df), pr=0.0001.

Data Source: *MWeb2009* for (1), (2), (5), and (6); *TWeb2009* for (3), (4), (7), and (8).

Table 5. Logit and ologit estimation of willingness-to-pay for surname retention (*WTP-name*) and for legal state (*WTP-legal*)

	Panel A: WTP-name					**Panel B: WTP-legal**				
	ordered logit			logit		ordered logit			logit	
	(1)	(2)	(3)[a]	(4)	(5)	(6)	(7)	(8)[a]	(9)	(10)
q5_pro-CS	1.066		1.232	1.08		2.148+		1.487	2.146+	
	[0.314]		[0.430]	[0.318]		[0.959]		[0.791]	[0.958]	
q5_uncertain	0.139+		0.265	0.142+		0.000		0.000	1	
	[0.143]		[0.278]	[0.146]		[0.001]		[0.001]	[.]	
q5_pro-DS	2.078***		2.831***	2.115***		2.581*		1.911	2.610*	
	[0.460]		[0.851]	[0.470]		[0.994]		[0.950]	[1.005]	
q5_pro-CS		2.394*			2.458*		5.996**			5.964**
#male		[0.878]			[0.906]		[4.072]			[4.050]
q5_uncertain		0.36			0.372		0.000			1
#male		[0.379]			[0.392]		[0.003]			[.]
q5_pro-DS		3.805***			3.993***		5.703**			5.776**
#male		[1.189]			[1.258]		[3.673]			[3.721]
q6_want-CS	0.766	0.763	1.199	0.752	0.749	0.873	0.851	1.525	0.867	0.845
	[0.170]	[0.169]	[0.320]	[0.167]	[0.167]	[0.297]	[0.289]	[0.718]	[0.295]	[0.288]
q6_want-DS	4.070***	3.943***	2.578**	4.271***	4.135***	2.145*	2.066+	2.593	2.124*	2.039+
	[0.931]	[0.903]	[0.861]	[0.996]	[0.966]	[0.811]	[0.786]	[1.549]	[0.804]	[0.776]
male	2.345***			2.465***		1.680+			1.688+	
	[0.445]			[0.476]		[0.485]			[0.488]	
age	1.009	1.009	1.009	1.012+	1.012*	0.999	1	1.002	0.999	1
	[0.006]	[0.006]	[0.007]	[0.006]	[0.006]	[0.009]	[0.009]	[0.012]	[0.009]	[0.009]
education_	1.173***	1.172***	1.115*	1.176***	1.175***	1.078	1.079	1.084	1.08	1.081
year	[0.049]	[0.049]	[0.055]	[0.049]	[0.049]	[0.068]	[0.068]	[0.087]	[0.069]	[0.069]
income	0.986	0.986	0.97	0.985	0.985	0.931+	0.929+	0.965	0.929+	0.927+
	[0.021]	[0.021]	[0.029]	[0.021]	[0.021]	[0.036]	[0.036]	[0.048]	[0.036]	[0.036]
city_special	0.856	0.871	0.8	0.817	0.83	0.363	0.361	0.242	0.354	0.354
	[0.297]	[0.303]	[0.346]	[0.287]	[0.292]	[0.267]	[0.266]	[0.250]	[0.261]	[0.261]
city_medium	1.016	1.026	1.402	0.98	0.989	0.752	0.756	0.395	0.74	0.743
	[0.249]	[0.251]	[0.398]	[0.243]	[0.245]	[0.304]	[0.306]	[0.248]	[0.299]	[0.301]
city_large	0.988	0.981	1.096	0.968	0.96	0.88	0.877	0.679	0.864	0.863
	[0.200]	[0.198]	[0.286]	[0.198]	[0.196]	[0.272]	[0.272]	[0.291]	[0.268]	[0.267]
N	1964	1964	944	1964	1898	1964	1964	944	1834	1834
Ll	-697.3	-694.4	-433.8	-489.1	-486.3	-308.3	-307.3	-171.5	-251.1	-250.1
Chi2	152	157.8	51.04	154.8	148.7	34.22	36.21	16.03	26.22	28.14
AIC	1430.6	1430.8	901.7	1004.3	1002.5	648.7	652.7	372.9	526.2	528.3
BIC	1531.1	1548	984.1	1076.9	1085.8	738	758.7	445.7	592.4	605.5

Notes: (a) (3) and (8) are estimates for male only. Cut-off points for ologit and constant for logit are omitted. Results are shown in exponentiated coefficients (odds ratios). For categorical variables, base categories are, q5_pro-alias, q6_uncertain, female, and city_other (towns). Significance level + p<0.10, *p<0.05, **p<0.01, ***p<0.001; standard errors in parentheses.

Data Source: *MainWeb2009*.

Table 6. Lower bound of expected willingness-to-pay for legal state ($E_{LB}WTP^{l}$) and rank analysis by legal preference (q5) and surname preference (q6) across gender

	Panel A: WTP-legal by legal preference (q5)								
	male			female			all		
	pro-CS	pro-DS	pro-alias	pro-CS	pro-DS	pro-alias	pro-CS	pro-DS	pro-alias
	(1)						(2)		
$E_{LB}WTP^{l}$	63.62	33.84	45.47	9.58	61.94	3.08	40.66	49.07	21.17
rank sum	283808	359058	239253	205460	423733	316276	489268	782790	555529
N[(a)]	11 / 283	17 / 355	6 / 242	4 / 209	19 / 420	3 / 325	15 / 492	36 / 775	9 / 567
P(WTP> 0)	0.039	0.048	0.025	0.019	0.045	0.009	0.030	0.047	0.016
	Panel B: WTP-legal by surname preference (q6)								
	male			female			All		
	want-CS	want-DS	uncertain	want-CS	want-DS	uncertain	want-CS	want-DS	uncertain
	(3)						(4)		
$E_{LB}WTP^{l}$	47.99	283.82	20.31	8.89	75.38	0.03	25.22	167.48	9.10
rank sum	547250	70542.5	338554	551629	150692	316412	1100000	221234	654966
N[(a)]	21 / 546	5 / 68	8 / 343	7 / 565	9 / 147	10 / 318	28 / 1111	14 / 215	18 / 661
P(WTP> 0)	0.039	0.074	0.023	0.012	0.061	0.031	0.025	0.065	0.027

Notes: (a) N for positive WTP and N for all observations; 13 incoherent cases (pro-CS & want-DS) are excluded.

Pearson χ^2 for $E_{LB}WTP$: (1) χ^2 =33.381 (36df), pr=0.594; (2) χ^2 =24.698 (16df), pr=0.075; (3) χ^2 =43.320 (20df), pr=0.002; (4) χ^2 =31.281 (8df), pr=0.000.

Kruskal–Wallis χ^2 with ties for rank $\boldsymbol{WTP^{l}}$: (1) χ^2 =18.461 (7df) and pr=0.0101; (2) χ^2 =15.638 (4df) and pr=0.0035; (3) χ^2 =17.324 (5df) and pr=0.0039; (4) χ^2 =10.253 (2df) and pr=0.0059.

Data Source: *MainWeb2009*.

Table 7. Generalized structural equations MIMIC estimations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)[a] male	(9)[a] female
Indicators	**Panel A: Measurement Part**								
q2_alias_opinion									
Fairness	1	1	1	1	1	1	1	1	1
	[.]	[.]	[.]	[.]	[.]	[.]	[.]	[.]	[.]
q1_surname opinion									
Attachment	1	1	1	1	1	1	1	1	1
	[.]	[.]	[.]	[.]	[.]	[.]	[.]	[.]	[.]
q5_legal_preference									
Fairness	1.371***	1.458***	1.474***	1.155*	1.155*	1.374***	1.469***	1.666***	1.194***
	[0.302]	[0.180]	[0.175]	[0.477]	[0.477]	[0.356]	[0.198]	[0.292]	[0.234]
q6_surname preference									
Fairness		2.006***	1.995***				1.836***	2.600**	3.071***
		[0.312]	[0.325]				[0.274]	[0.980]	[0.657]
Attachment	1.432**	2.249***	2.084***	2.688***	2.634***	2.495***	1.905***	2.771**	1.539***
	[0.448]	[0.434]	[0.371]	[0.543]	[0.520]	[0.519]	[0.404]	[0.844]	[0.313]
q4_surname change feelings									
Attachment		1.155***	1.227***	1.523***	1.523***	1.417***	1.034***	0.748***	1.809***
		[0.181]	[0.186]	[0.194]	[0.193]	[0.189]	[0.181]	[0.163]	[0.326]
q12_gravevisit_opinion									
Attachment			-0.368***			-0.520***	-0.441***		
			[0.095]			[0.112]	[0.114]		
1.q7_marry–change									
Fairness	0.377**	0.214*	0.332**			0.303**		0.372*	0.070
	[0.130]	[0.102]	[0.114]			[0.106]		[0.159]	[0.137]
Attachment	-0.963***	-1.262***	-1.432***	-1.019***	-1.064***			-0.718***	-2.390***
	[0.193]	[0.226]	[0.252]	[0.169]	[0.161]			[0.207]	[0.539]
sex_male		-0.573***		-0.772***		-0.628***			
		[0.139]		[0.127]		[0.117]			
q5_pro-CS				1.911***					
				[0.246]					
q5_pro-alias				2.214***					
				[0.235]					
q5_pro-DS				2.156***					
				[0.232]					
q5_pro-CS					z				
#male					[0.191]				
q5_pro-alias					-0.610***				
#male					[0.185]				
q5_pro-DS					-0.269				
#male					[0.177]				
q6_want-CS						1.339***			
						[0.140]			
q6_want-DS						0.168			
						[0.213]			
q6_want-CS							-0.368**		
#male							[0.134]		

q6_want-DS							0.176		
#male							[0.397]		
constant	1.283***	1.544***	1.394***	-0.019	1.934***	1.556**	1.409***	0.422	2.320**
	[0.281]	[0.330]	[0.371]	[0.298]	[0.238]	[0.125]	[0.081]	[0.319]	[0.709]
2.q7_marry–retain with payment									
Fairness	0.941***	1.018***	0.911***			0.918***		1.005***	1.190***
	[0.186]	[0.168]	[0.161]			[0.201]		[0.244]	[0.285]
Attachment	-0.266	-0.638**	-0.595**	0.355	0.477*			-0.835**	-0.020
	[0.169]	[0.217]	[0.208]	[0.221]	[0.231]			[0.275]	[0.494]
sex_male		0.643**		0.364+		0.737***			
		[0.210]		[0.188]		[0.213]			
q5_pro-CS				3.432***					
				[1.035]					
q5_pro-alias				3.349**					
				[1.025]					
q5_pro-DS				4.092***					
				[1.013]					
q5_pro-CS					0.459				
#male					[0.302]				
q5_pro-alias					-0.141				
#male					[0.314]				
q5_pro-DS					1.016***				
#male					[0.222]				
q6_want-CS						1.145***			
						[0.251]			
q6_want-DS						1.711***			
						[0.280]			
q6_want-CS							0.366+		
#male							[0.221]		
q6_want-DS							2.012***		
#male							[0.447]		
constant	-1.874***	-2.100***	-1.387***	-5.028***	-1.584***	-3.321***	-1.147***	-1.952**	-3.594***
	[0.419]	[0.447]	[0.370]	[1.021]	[0.265]	[0.508]	[0.148]	[0.620]	[0.944]
3.q7_not marry–retain									
Fairness	-0.860**	-0.869***	-1.089***			-0.478*		-1.328**	-0.248
	[0.288]	[0.255]	[0.303]			[0.237]		[0.498]	[0.653]
Attachment	-0.087	0.095	0.242	0.069	0.067			0.184	3.327
	[0.310]	[0.362]	[0.346]	[0.511]	[0.486]			[0.392]	[2.561]
sex_male		1.154**		1.243***		1.426***			
		[0.391]		[0.373]		[0.367]			
q5_pro-CS				2.223**					
				[0.782]					
q5_pro-alias				0.979					
				[0.724]					
q5_pro-DS				0.827					
				[0.662]					
q5_pro-CS					2.393***				
#male					[0.436]				
q5_pro-alias					0.961+				
#male					[0.527]				
q5_pro-DS					0.788				
#male					[0.536]				
q6_want-CS						2.361***			

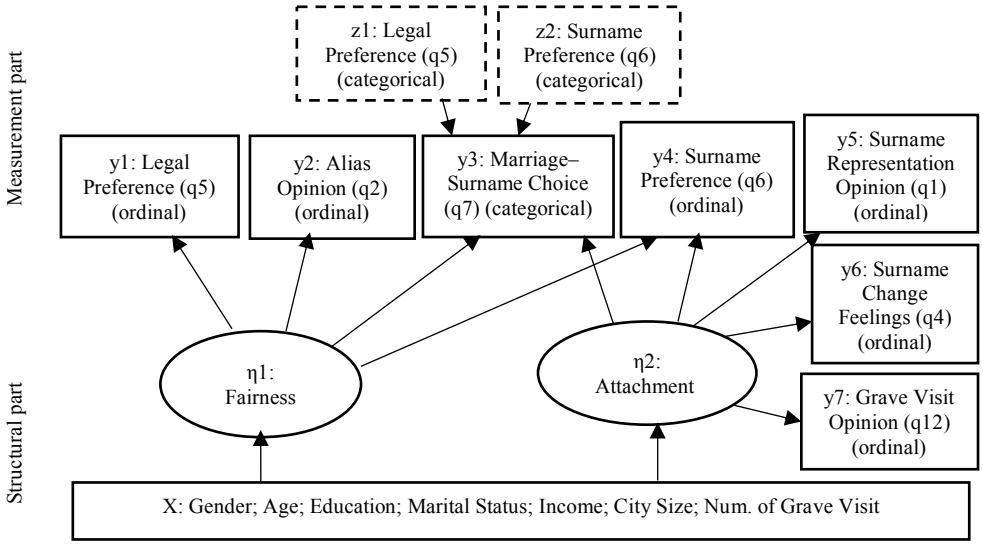
						[0.530]			
q6_want-DS						2.942***			
						[0.656]			
q6_want-CS							2.081***		
#male							[0.405]		
q6_want-DS							1.776*		
#male							[0.869]		
constant	-1.940***	-3.052***	-2.495***	-4.319***	-3.202***	-4.871***	-3.162***	-1.793**	-7.339+
	[0.401]	[0.472]	[0.490]	[0.813]	[0.437]	[0.580]	[0.361]	[0.565]	[3.764]
Latent	**Panel B: Structural Part**								
Fairness									
male	-0.372***	-0.408***	-0.450***	-0.373***	-0.373***	-0.343***	-0.406***		
	[0.090]	[0.072]	[0.072]	[0.100]	[0.100]	[0.086]	[0.073]		
age	-0.004	-0.002	-0.00265	-0.005	-0.005	-0.004	-0.002	0.001	-0.006
	[0.003]	[0.003]	[0.003]	[0.004]	[0.004]	[0.003]	[0.003]	[0.004]	[0.005]
education_year	0.080***	0.058***	0.0541**	0.076*	0.076*	0.079**	0.048**	0.034+	0.110**
	[0.023]	[0.017]	[0.017]	[0.031]	[0.031]	[0.024]	[0.017]	[0.020]	[0.034]
marriage_single	0.253*	0.339***	0.356***	0.280*	0.280*	0.237*	0.324***	0.432**	0.161
	[0.108]	[0.094]	[0.090]	[0.129]	[0.129]	[0.107]	[0.096]	[0.136]	[0.145]
marriage_	0.314+	0.455**	0.470**	0.375+	0.375+	0.285+	0.454**	0.439+	0.463*
divorced	[0.171]	[0.156]	[0.153]	[0.219]	[0.219]	[0.171]	[0.157]	[0.234]	[0.224]
marriage_	0.017	-0.022	-0.0388	0.119	0.119	0.037	0.010	-0.004	0.021
widow	[0.218]	[0.190]	[0.182]	[0.294]	[0.294]	[0.227]	[0.200]	[0.389]	[0.270]
income	-0.006	-0.010	-0.00864	-0.002	-0.002	-0.007	-0.006	-0.012	-0.006
	[0.008]	[0.007]	[0.007]	[0.010]	[0.010]	[0.009]	[0.008]	[0.010]	[0.012]
city_special	0.001	-0.049	-0.0558	0.009	0.009	0.010	-0.049	-0.068	0.040
	[0.147]	[0.129]	[0.125]	[0.163]	[0.163]	[0.147]	[0.131]	[0.157]	[0.225]
city_medium	0.085	0.060	0.0574	0.119	0.119	0.090	0.089	0.147	-0.047
	[0.108]	[0.096]	[0.094]	[0.123]	[0.123]	[0.108]	[0.100]	[0.126]	[0.158]
city_large	0.273**	0.252**	0.239**	0.313**	0.313**	0.276**	0.274***	0.104	0.423***
	[0.090]	[0.078]	[0.076]	[0.106]	[0.106]	[0.092]	[0.080]	[0.104]	[0.127]
Attachment									
sex_male	0.046	0.056	0.179**	-0.091+	-0.089+	-0.093+	0.055		
	[0.112]	[0.065]	[0.067]	[0.051]	[0.051]	[0.053]	[0.071]		
age	-0.004	-0.004	-0.003	-0.003	-0.003	-0.003+	-0.005+	-0.006	-0.002
	[0.003]	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]	[0.003]	[0.004]	[0.003]
education_year	0.010	-0.003	0.000397	0.023*	0.024*	0.019+	0.001	-0.027	0.013
	[0.017]	[0.015]	[0.014]	[0.011]	[0.011]	[0.011]	[0.015]	[0.021]	[0.017]
marriage_single	0.737***	0.493***	0.466***	0.462***	0.460***	0.517***	0.597***	0.762***	0.252*
	[0.140]	[0.102]	[0.099]	[0.081]	[0.081]	[0.088]	[0.115]	[0.158]	[0.102]
marriage_	0.812***	0.522***	0.486***	0.507***	0.504***	0.569***	0.614***	0.637*	0.393**
divorced	[0.175]	[0.138]	[0.133]	[0.113]	[0.114]	[0.115]	[0.147]	[0.253]	[0.127]
marriage_	0.145	0.035	0.0688	0.004	0.006	0.025	0.051	1.021**	-0.225
widow	[0.218]	[0.189]	[0.184]	[0.150]	[0.151]	[0.156]	[0.205]	[0.384]	[0.160]
income	0.033**	0.031***	0.0306***	0.017**	0.018**	0.016**	0.028**	0.030*	0.027***
	[0.012]	[0.008]	[0.008]	[0.006]	[0.006]	[0.006]	[0.009]	[0.013]	[0.008]
city_special	-0.283*	-0.233*	-0.219*	-0.178*	-0.178*	-0.180*	-0.228+	-0.142	-0.248*
	[0.127]	[0.107]	[0.105]	[0.085]	[0.085]	[0.089]	[0.119]	[0.174]	[0.125]
city_medium	0.004	-0.008	-0.0154	0.025	0.025	0.004	-0.053	0.124	-0.166+
	[0.098]	[0.082]	[0.080]	[0.066]	[0.066]	[0.068]	[0.088]	[0.125]	[0.094]
city_large	0.079	-0.068	-0.0657	0.029	0.026	0.017	-0.106	-0.079	-0.071
	[0.079]	[0.066]	[0.065]	[0.056]	[0.056]	[0.058]	[0.074]	[0.106]	[0.069]
num_grave-			-0.0279+			-0.034*	-0.039*		
visit			[0.015]			[0.014]	[0.018]		

N	1987	1987	1987	1987	1987	1987	1987	957	1030
Log-likelihood	-10336.7	-12405.1	-13782.1	-12508.9	-12527.3	-13900.7	-13845.2	-6026.2	-6266.4
AIC	20761.3	24914.2	27670.3	25131.8	25168.6	27917.3	27802.4	12146.3	12626.8
BIC	21007.5	25205.1	27966.8	25450.7	25487.5	28241.8a	28115.7	12374.9	12858.9

*Note*s: (a) Model (7) is estimates for male sub-samples and model (8) is estimates for female sub-samples, both corresponding to model (2). The integration method for optimization applies mean-and-variance adaptive Gauss-Hermite quadrature, and a different stepping algorithm is used in non-concave regions. For categorical variables, base categories are, q4_nofeeling, q5_uncertain, q7_uncertain, sex_female, marriage_married, and city_other (towns). Significance level: + p<0.10, *p<0.05, **p<0.01, ***p<0.001; standard errors in parentheses.

Data Source: *MainWeb2009*.

Figure 1. The MIMIC model



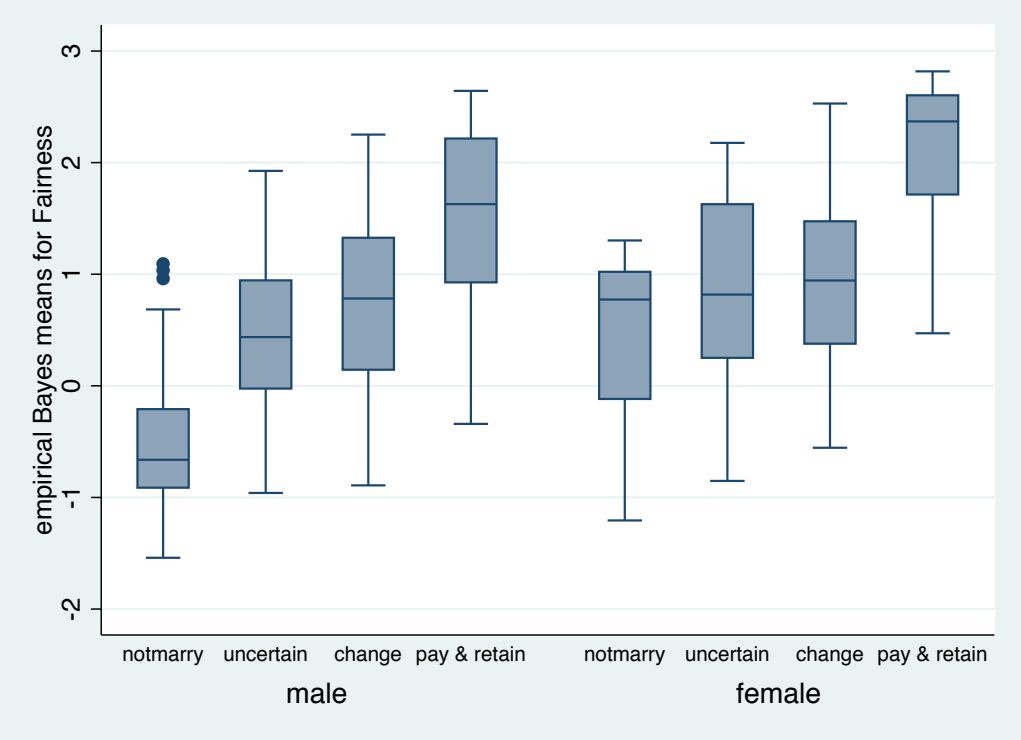
APPENDIX I: LIST OF QUESTION AND ANSWERS

	Question:	Answer choices:
Q1 *Main & Trial*	How do you think of a surname, what does it mean to you? (multiple answers (ma))	(1) yourself; (2) ancestor; (3) couple; (4) other;(5) don't know
Q2 *Main & Trial*	Do you think there would be some kind of inconvenience at a workplace if a person has to change her surname due to marriage? If you think there are some inconveniences, how would you feel about it? (single answer (sa))	(1) there are inconveniences & better not to have them; (2) there are inconveniences but that's the way it goes (too bad); (3) there are inconveniences but not sure how I feel; (4) there is no inconvenience; (5) don't know
Q3 *Main & Trial*	(SQ2). Some people think that one can avoid the inconvenience caused by surname change through the use an alias or "*tsusho*." How do you think about this idea? (sa)	(1) inconvenience can be avoided; (2) there would still be some inconvenience; (3) don't know
Q4 *Main & Trial*	Question 4. How would you feel if your surname is changed due to marriage? Please answer regardless of your marital status. (ma)	(1) united; (2) new life; (3) strange; (4) self-loss; (5) no feel; (6) other; (7) don't know
Q5 *Main*	How do you think about amending the current law to allow selective dual surnames which permit each of the couple to retain their original surnames should they wish to do so? The current law dictates that a married couple must have a common surname. (sa)	(1) no need to revise the law; (2) fine to revise the law to allow dual surnames; (3) fine to revise the law to allow an alias officially; (4) other; (5) don't know
Q5 *Trial*	Currently, a married couple must have a common surname. However, there are views that it is better to amend the law in order to allow married couples to retain their original surnames should they wish to do so. What do you think about such views? (sa)	(1) no need to revise the law; (2) fine to revise the law to allow dual surnames; (3) fine to revise the law to allow an alias officially; (4) don't know
Q5_1 *Main*	If an NGO which promotes a legislative policy that coincide with your own opinion on dual surname system, would you make any donation to this NGO? (s.a.)	(1) no need to revise the law & no wish to donate; (2) no need to revise the law & wish to donate; (3) fine to revise the law to allow dual surnames & no wish to donate; (4) fine to revise the law to allow dual surnames & wish to donate; (5) fine to revise the law to allow an alias officially & no wish to donate; (6) fine to revise the law to allow an alias officially & wish to donate; (7) others/don't know
Q5_1 *Trial*	The previous question has asked your opinion about the law amendment to allow dual surnames for married couples. In order for your opinion to be reflected to policy making, would you be willing to pay some money? (sa)	(1) not willing to pay for my opinion to be reflected in policy making; (2) willing to pay some money for my opinion to be reflected in policy making; (3) don't know
Q5_1_1~3 *Main*	How much donation are you willing to make?	(1) less than 1,000yen; (2) 1,000~<5,000yen; (3) 5,000~<10,000yen;

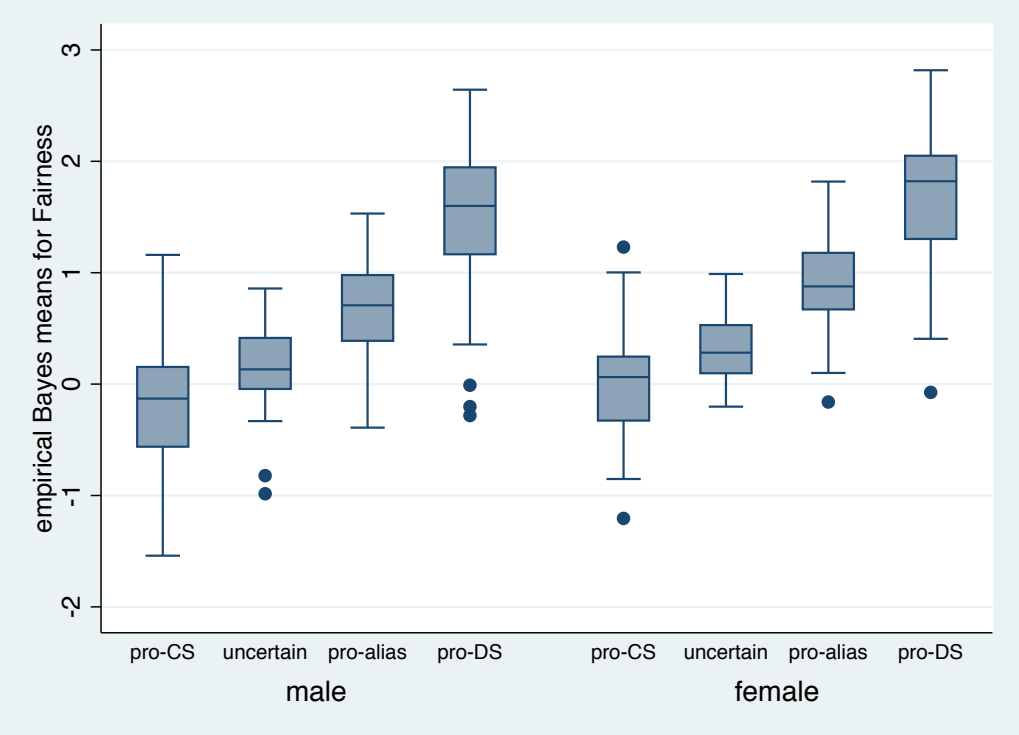
		(4) 10,000~<30,000yen; (5) 30,000~<50,000yen; (6) 50,000~<100,000yen; (7) 100,000~<200,000yen; (8) 200,000~<500,000yen; (9) 500,000~
Q6 *Main* & *Trial*	If the legislation is amended to allow a married couple to retain their own original surnames, would you wish to choose dual surnames as a couple upon marriage? Please reply regardless of your marital status. (sa)	(1) yes, want dual surnames; (2) no, don't want dual surnames; (3) don't know
Q6_1 *Main*	For those who replied (2) "No" in Q6, whose surname would you like to take as a married couple? (sa)	(1) my own surname; (2) my spouse's surname; (3) either one; (4) don't know
Q7 *Main*	If you ever have to change your own surname upon marriage, what would you do? (sa)	(1) change surname; (2) if changing the surname can be avoid by paying designated fees for public administration, will do so; (3) give up getting married; (4) don't know
Q7 *Trial*	If you ever have to change your own surname upon marriage, what would you do? (sa)	(1) change surname; (2) if can avoid changing the surname by paying money, will do so; (3) give up getting married because do not want to pay money nor to change surname; (4) either/don't know
Q7_1 *Main*	For those who replied (2) "pay fees if can avoid changing the surname," how much are you willing to pay to the public administration? (sa)	(1) less than 5,000yen; (2) 5,000~<10,000yen; (3) 10,000~<30,000yen; (4) 30,000~<50,000yen; (5) 50,000~<100,000yen; (6) 100,000~<200,000yen; (7) 200,000~<500,000yen; (8) 500,000~<1,000,000yen; (9) 1,000,000~
Q7_1 *Trial*	You have answered "if can avoid changing the surname by paying money, will do so" in the previous question. How much are you willing to pay? (sa)	(1) less than 1,000yen; (2) 1,000~<5,000yen; (3) 5,000~<10,000yen; (4) 10,000~<30,000yen; (5) 30,000~<50,000yen; (6) 50,000~<100,000yen; (7) 100,000~<200,000yen; (8) 200,000~<500,000yen; (9) 500,000~

APPENDIX II: EMPIRICAL BAYES MEANS OF PREDICTED LATENT VARIABLES

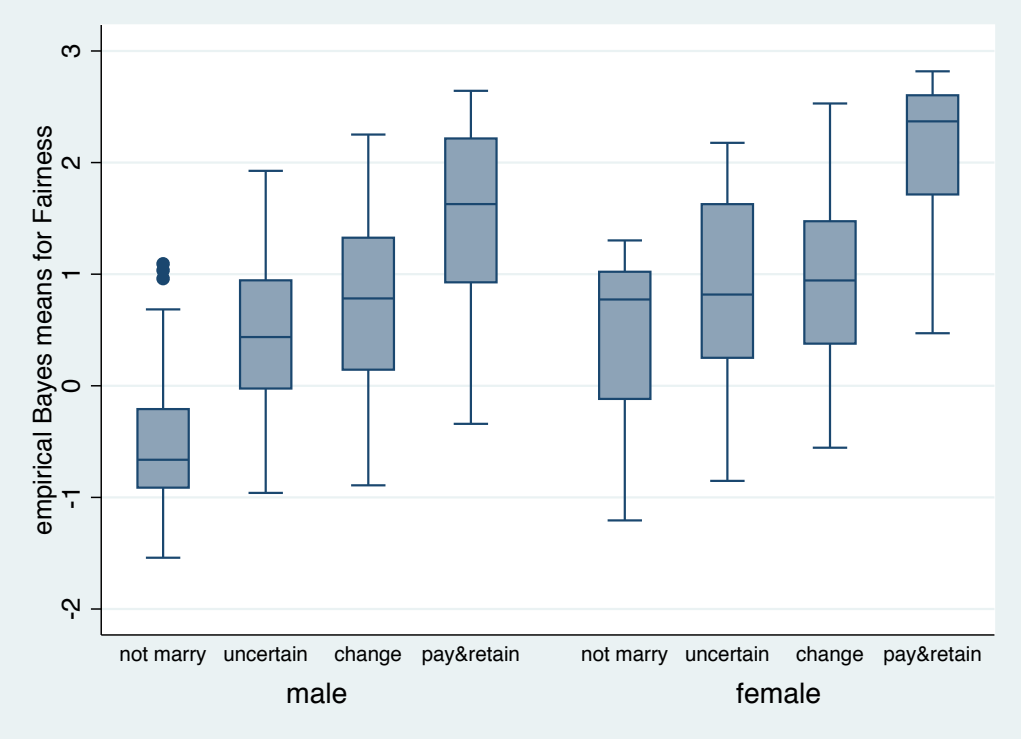
Predicted latent *Fairness* over an ordinal response variable q2 (opinion on surname inconvenience) across gender



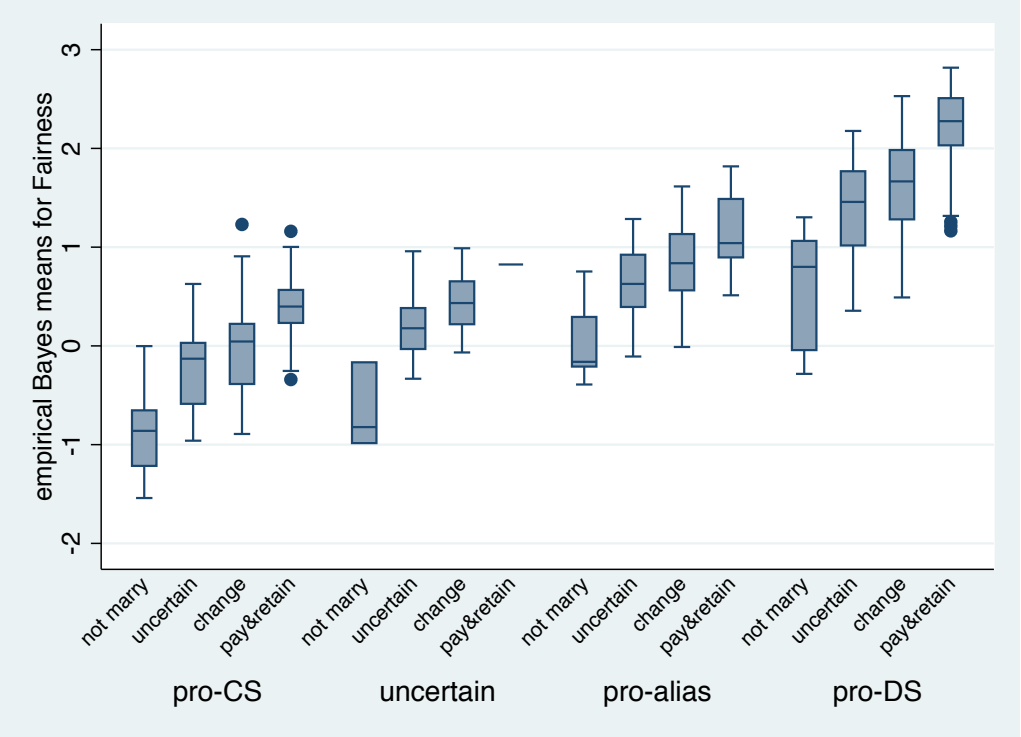
Predicted latent *Fairness* over an ordinal response variable q5 (legal preference) across gender



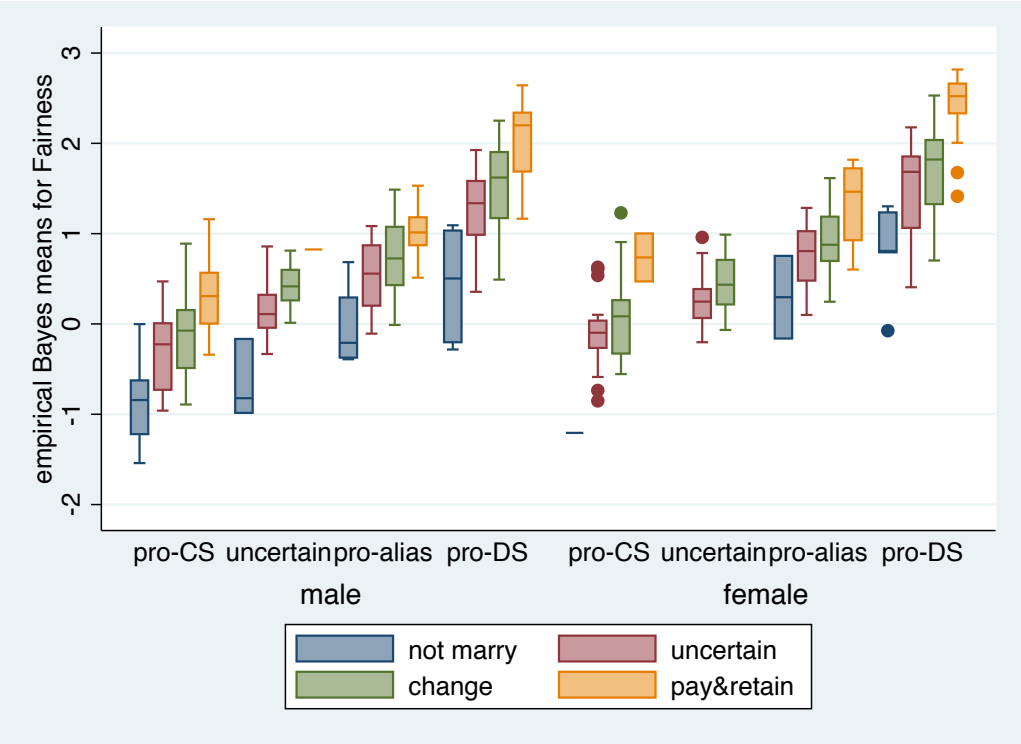
Predicted latent *Fairness* over an categorical response variable q7 (marriage-surname choice) across gender



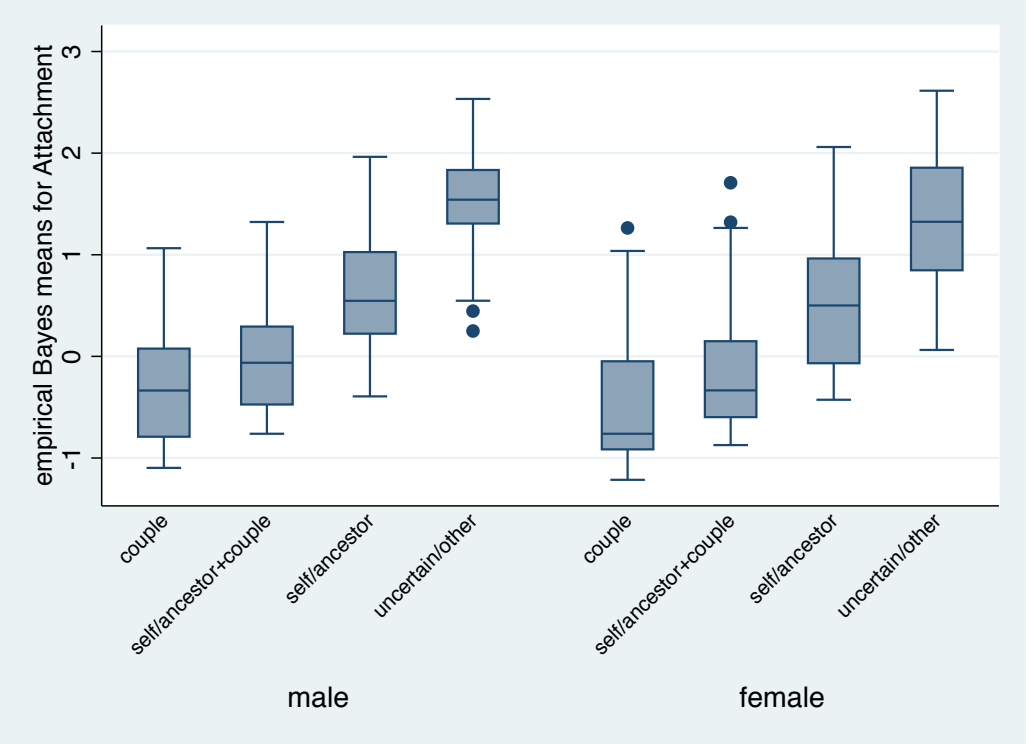
Predicted latent *Fairness* over an categorical response variable q7 (marriage-surname choice) across q5 (legal preference)



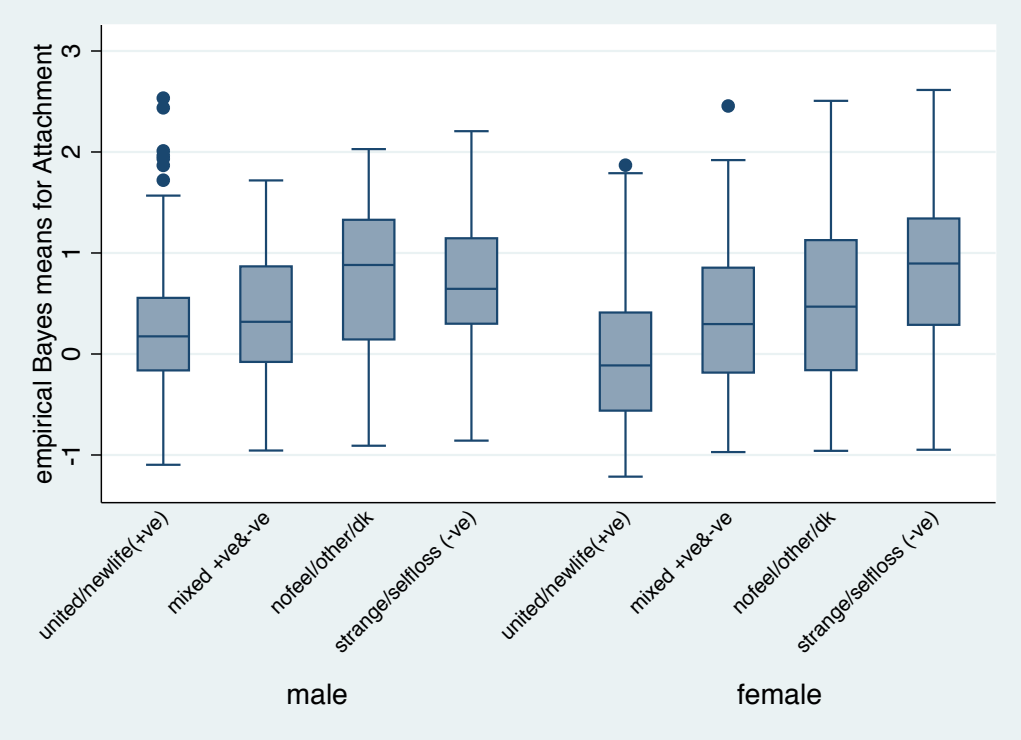
Predicted latent *Fairness* over an categorical response variable q7 (marriage-surname choice) across gender and q5 (legal preference)



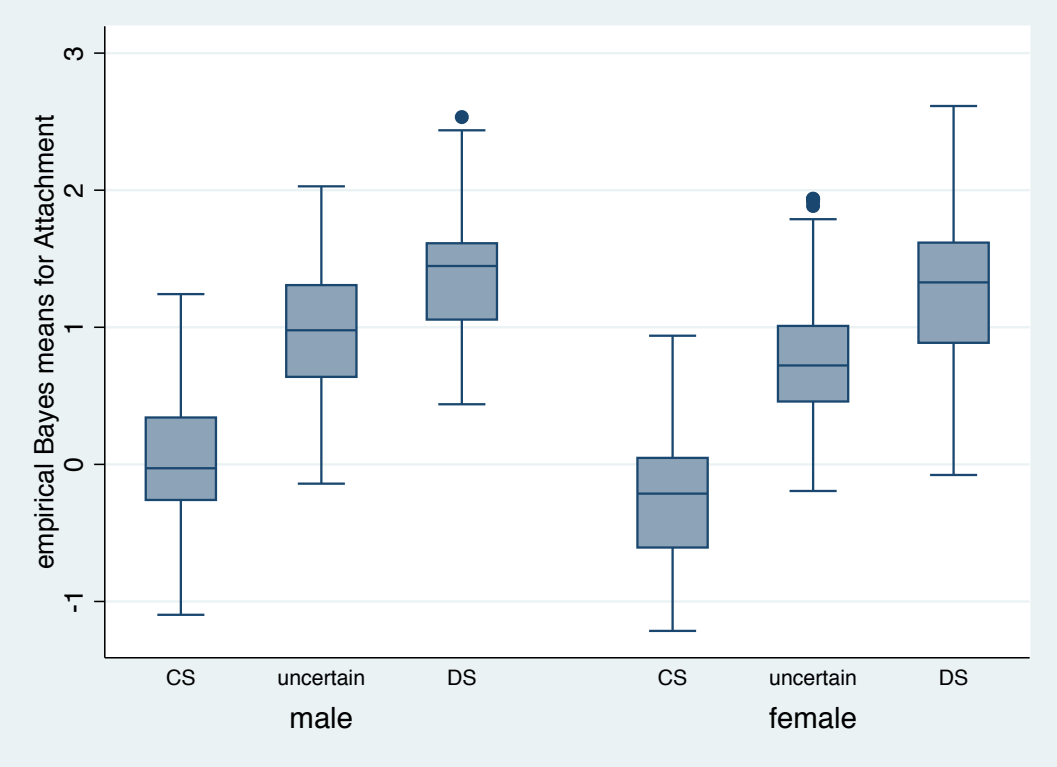
Predicted latent *Attachment* over an ordinal response variable q1 (surname opinion) across gender



Predicted latent Attachment over an ordinal response variable q4 (surname change opinion) across gender



Predicted latent Attachment over an ordinal response variable q6 (preferred surname) across gender



Predicted latent Attachment over an ordinal response variable q12_1 (opinion ancestral grave visit) across gender