Household partition in a north Indian village (1958-2009)

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Abstract

The paper analyses whether specific demographic behaviours, i.e. control of fertility and household partition, have been evolving in rural India with increasing demographic pressure on land. Using longitudinal data from 1958 to 2009 of the full population in a north Indian village, we analyse the determinants of household partition at individual and household levels over time, assessing the role of land owning and fertility and whether caste specificities influence these responses.

Keywords: land, fertility, household partitioning, jati, caste.

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1 Introduction

The persistence of extended joint household in rural India and other parts of South Asia has been extensively debated in the 1990s with the emergent tendency of household partition (Foster 1993, Ram and Wong 1994, Kolenda 1987, Freed and Freed 1982) but different case studies lead to incongruent conclusions concerning the determinants of the household structure. Indeed, the joint family controversy was challenged by problems of definition and a scarcity of data that involved a significant time dimension (Freed and Freed 1982, Doveri 2000). Surprisingly, it is impossible to find, in the recent literature, any study assessing the relation between household structure, fertility and landowning in rural communities. However, studying the patterns and the determinants of the household structure is with no doubt of great relevance in a context of demographic transition and land shortage which brings many changes for the rural societies as it is the case for India.

This paper analyses the determinants of partitioning from joint households to nuclear units in a context of post-agrarian transition with increasing demographic pressure on land. We use longitudinal data on the full population of Palanpur, an Indian village located in Uttar Pradesh which has been surveyed six times from 1958 to 2009.

In Palanpur, most people still depend on agriculture for living, but the available land per capita has dramatically decreased since the early 1980s because of the high rate of fertility and the land fragmentation. We found that episodes of household partition have become more frequent over time, and we attempt to identify a set of determinants at the individual and household level. First, we examine the probability of partitioning in association with different levels of fertility and landowning and their degree of variation over time and second, we analyse if there are specific caste-based preferences for partitioning.

We assume that rational behaviours emerge at the household level to optimise the inheritance according to present characteristics of wealth and household composition, but also to the representation of future resource allocation, which is influenced by past events. Hence, the range of behaviours that an individual can adopt to secure his offspring might assume different levels of rationality. Moreover, the rationality is shaped by the local systems of norms, which can differ across different social groups. Lanjouw and Stern (1998) found a positive correlation between landowning and fertility in Palanpur, consistent with other studies at an early stage of the demographic transition (Nagarajan and Krishnamoorty 1992, Saavala 1996). They suggest that the reason for the positive link might be that landed households tend to live in extended joint households where the consumption function of an additional child weights less compared to nuclear households because the cost of child-bearing is shared among all the adult members. But, according to Das Gupta's (1984) hypothesis, this relationship may disappear at later stages of the demographic transition reflecting that wealthy households are more inclined to control fertility because of higher income and higher educational achievement.

Our results show that there is a negative association between landowning and partitioning, especially for large landowners. This point confirms the argument of Lanjouw and Stern of households living jointly and suggests that economies of scale and maintenance of a joint structure, where resources and expenditures are pooled together, are preferred by landed household who would meet significant losses by fragmenting their estate through partitioning. Moreover, we found a higher rate of fertility associated with partitioning, suggesting that fertility control is higher for couples

living in a joint household. These associations explain in large part the propensity to partition for most of the population in Palanpur and irrespective of the caste affiliation except for the Jatav, a sub-caste from the bottom of the caste hierarchy, who appear to have a specific preference for partition.

2 Review of the literature

Despite a large number of contributions on the relationship between land and demographic behaviours in agrarian and proto-industrial societies, not a single theoretical approach standing up to empirical evidence has gained a consensus (Doveri 2000).

The existing literature about the relationship between economic resources and demographic behaviours in agrarian societies mostly relies on Chayanov's life-cycle theory (1966) stating that the demographic behaviours of peasant households are oriented to achieve a point of equilibrium between land and labour. The Chayanov's model can hardly be applied to non-Russian agrarian societies because of its limiting assumptions: land availability stable over time, absence of real estate market and isolation from proto-industrial activities. Nonetheless, the adoption of intra-household processes of decision-making to achieve a point of equilibrium has been demonstrated by other studies in different contexts, both in western and non-western societies. These studies insist on the rationality of fertility being determined by the parent's perception of the value of an additional child in terms of costs and labour force (Birdsall 1988, Wilk 1990, Strauss and Thomas 1995). A child incorporates three main functions: consumption, work and security utilities. In the subsistence sector, the consumption utility of an additional child is negligible, and children are mainly a factor of production and protection for parents' retirement, especially in the absence of a formal system of welfare (De Janvry and Garramon, 1977).

Hence the demographic behaviours of the rural households are thought to be mainly influenced by the value of these two functions in the parent's perception. Their perception is expected to vary according to the land endowment of the household, but it is difficult to determine in what direction. According to Levine's studies (1977) of early industrialisation in England, the peasant families maintain the Chayanov's equilibrium between land and labour with late age marriage and restriction of fertility. In contrast, with the transition from a peasant society to industrialisation, the proletarian families involved in uncontrolled fertility (Medick, 1976): non-farm transition is then considered to affect positively the fertility rate rather than landholding and cultivation. Land availability would also tend to reduce fertility by providing an alternative mean of security, thus substituting for children's support in parent's perception (Vlassoff 1990, Sutherland et al. 2004). Besides, landholding is supposed to have indirect effects on fertility by creating economic security which is associated with higher living standards, access to health care and higher educational opportunities, all of which promote lower fertility (Hiday 1978, Coomes et al. 2001, Carr et al. 2006).

On the other side, those who consider landholding to have a positive effect on fertility argue that when there is a growth of population without a parallel growth of available land, an increasing degree of self-exploitation by the peasant labour force is the only possible answer. Hence the peasant would choose to increase the size of his labour force (Warman, 1978). From this point of view, the size of landholding influences fertility by altering the cost-benefit of the value of

additional children. More extensive landholding may foster fertility to accommodate increased labour requirement (Stokes and Schutier, 1984).

A further argument consists of the aversion for land fragmentation among households with large landholding. Landless have nothing to lose by having many children while farmers who own land have much to lose from subdividing the land for their children and so they tend to have lower fertility (Vlasoff and Vlasoff 1980, Schutjer et al. 1983). This hypothesis is persistent with the studies indicating a strong association between joint-family living and land ownership in rural India (Mandlebaum 1970, Swartzberg 1979, Caldwell et al. 1984, Ram and Wong 1984, Krishnaji 1984, Nagarajan and Krishnamoorthy 1992). Economies of scale in agricultural production offer a plausible explanation for this association: living in a joint-family may be particularly advantageous for landed families. Some of the advantages include mutual insurance, the transmission of knowledge across generations, physical strength and protection against theft, the achievement of power and prestige in the village society (Mandelbaum 1970, Swartzberg 1979, Srinivas 1982, Oldenburg 1992, Lanjouw and Stern 1998).

However, Wall's studies of four English communities in pre-industrial time raised contradictory conclusions concerning the availability of land and household composition. His results showed that landless households and small landholders were living in extended families as much as large landowners, while artisans and merchants were even more extended, which means that the latter had a stronger preference for extended joint household than landed households and cultivators. Wall's study challenges the theoretical assumption that in pre-industrial societies the availability of land has a direct effect on the household structure and the demographic trends. Instead, Wall suggests that land cannot be taken for granted as the most critical factor in determining the household structure and the demographic behaviours should be examined by taking socio-economic and cultural factors in consideration (Quinlan, Shackleford, 1994).

However, by looking at state of the art, it seems that investigations on the presence and the role of different family ethics according to different social groups behind the link between land and family structure are very limited. Caldwell, Reddy and Caldwell (1984) applied a quasi-anthropological approach to the study of the determinants of family structure in 9 villages from South India and stated that caste and socioeconomic characteristics did not affect the family patterns. Because of substantial similarity in behaviour between different caste, they did not distinguish caste groups in their analysis and concluded that the society was remarkably homogeneous. They also argued that there was little evidence of transition in family structure since there were no systematic aspects in timing or nature of household partition and they claimed that families are more likely to change in terms of internal relations and in the likelihood of wealth flow reversing (Caldwell, 1982) than they are in external structure.

A recent study about the future of the family farms in West Africa has provided evidence that the reduction in farm size leads to more individualistic management methods internally to the household (Bélières et al., 2002). By extension, we may expect that land shortage leads to greater household partition in rural India, especially among households having small or no landholding.

3 Conceptual framework and institutional setting

This contribution aims to verify whether partitioning has been evolving in time in rural India, under which conditions and if the propensity to partition differs across different castes. A partition is defined as a split from a joint household. After the partition from the joint household, the partitioned unit consists of a nuclear family whose head was not head previously. A married son can deliberately decide after marriage to form a separate nuclear household living in a different house with his wife and children. We believe this decision to be determined by a set of factors, both at the individual and the household level, which are themselves influenced by the institutional setting of the caste social order, the household model and the land succession rights.

3.1 The caste relations

In the agrarian society the strong correlation between the jati (sub-caste)[1] and the occupation was the core organizational factor of the economy of the village (Dumont 1980), it determined the social and professional trajectories of individuals and the hierarchic system of interdependent relations existing between dominant castes of landlords and the lower castes providing services for them and working as agricultural labourers in their fields. The intra-household social relations of production are embedded in a complex system of local norms and they are specific to the caste affiliation[2].

As per the caste social order, land is not only valued as an economic resource, but it also acts as a social marker of status and power in the rural community: working in non-farm manual jobs is considered an unbearable shame for upper castes, selling land to lower castes affects negatively the social status of upper caste, similarly, working for lower castes landlords from the same village is impossible, etc. Therefore, the attachment to land possession is determined by the caste affiliation and the desire to maintain a certain position in the hierarchy or to transcend the rigid social order by getting empowered trough land acquisition.

3.2 The household model

The notion of household is not easy to define in the context of rural India: Kolenda (1968) made a comparison of 26 studies of Indian household types and noted that any of them applied the same definitions. As per the Census of India, *a household is a group of persons who live together and take their meals from a common kitchen unless the exigencies of work prevent any of them from doing so.* The joint household is the predominant model of family structure in rural India. This model is commonly extended to 3 generations of males lineally descendent from a common ancestor and includes their nuclear families, wives and children. Daughters leave their original household after marriage and go to reside with their family-in-law. The joint family may also extend to other members, like the head's widowed mother, if alive, the head's brothers and sisters or some

[1] Behind the broad categories of castes derived from the hierarchic social order established since Vedic time (1500-500 B.C.) to distinguish four groups of humans according to their degree of purity (brahman, kshatriya, vaishya and shudras), it exist a wide-range of sub-categories, called jati and defined in the Indian anthropological literature as birth groups, in other words a group structured by paternal lineage and kinship, related to a specific name. The reproduction of this social group is maintained by the principle of endogamy, that makes the jati a fundamental social reference for most Indians (Headley in Jaffrelot and Naudet, 2013).

[2] Upper castes prevent women to work in the family farm.

relatives of his wife in extraordinary circumstances. For the sake of clarity, we distinguish in our analysis only two typologies of household structure: joint and nuclear. The joint household includes the patrilineal joint family, where the patriarch is the head and the patri-fraternal joint family, consisting of several married brothers and their nuclear families where the eldest son normally becomes the household head after the death of his father. Nuclear household generally corresponds with an episode of partition. In the joint typology, the headship is transmitted through the process of inheritance to the eldest son who continues to share with his brothers the land ownership and other indivisible productive assets, while in the second case the common ownership gets divided in rights and use. In both cases, the previous head can be died, migrated or still alive.

3.3 The land succession rights

Inheritance and partition follow specific rules of land succession. According to the Hindu Succession Act of 1956 in the absence of a will, all the direct heirs of the head have the right to an equal share of his property. Heirs consist of his wife and children, sons and daughters, and his widowed mother[3], but in practice, patrilineal inheritance is the common rule followed in rural areas, which implies a partible inheritance to sons. According to the Hindu law the ancestral property, defined as an undivided property of the household which has been inherited through at least four generations of male lineage, differs from self-acquired land in rights. In the case of ancestral property, the rights accrue by birth only, contrary to inheritance rights that open on the death of the head, and they are determined per stirpes and not per capita. Once an ancestral property is partitioned between the members of the household, it ceases to be ancestral property and the share of each coparcener becomes their self-acquired property. In case of partition before the death of the patriarch, it seems to be no agreed norms about the succession of land. Lanjouw and Stern (1998) say that in such situation a form of pre-mortem inheritance takes place: formal ownership rights remain vested in the head, but the use of the share of land destined to his son's inheritance is conceded on a long-term basis.

4 Land and demography in Palanpur

Palanpur is a village of about 1200 inhabitants located in Moradabad district (Uttar Pradesh). The full population of the village has been surveyed six times with approximatively ten-years interval since 1958 to 2009 by the Agricultural Economics Research Center (AERC) of the University of Delhi, the London School Economics (LSE) and the Center for Social Sciences and Humanities of New Delhi (CSH). This panel includes data at the individual level and tracks household over time covering demographics, education, occupation, migration, consumptions, income, credits, durables, health and social protection.

A critical feature of this panel is the possibility to disaggregate the four-fold administrative caste scheme (i.e. General caste, Other backward caste, Scheduled caste, Scheduled tribes) which is used by the Census and the National Sample Survey. We use the original Jati classification that is more relevant to understand the economic and social segmentation since they constitute the concrete endogamous social groupings. Moreover, in the case of Palanpur, we have access to land

[3] Only male members were coparceners prior to the Amendment Act stipulated in 2005 which confers equal rights of coparcener to daughters but it is very rarely respected in practice.

ownership data for each survey with information on the process of change in land ownership, which makes this dataset almost unique in India. Land ownership data for rural India are not easy to obtain from secondary sources, and the information that does exist (e.g. from the National Sample Survey) tends to be quite unreliable due to the sensitive nature of the data. Also, available land ownership data from large-scale surveys raise important issues of comparability over time.

The period spanned by the study covers a series of fundamental changes, from the land reforms (Zamindari Abolition Act of 1951) after the Independence (1947), to the green revolution of the 1960 and 1970s, the increasing integration of the village with urban markets and the diversification of the sources of livelihoods out of farming. Throughout the whole period, Palanpur has witnessed a constant demographic expansion, from 530 inhabitants in 1958 to 1255 in 2009 net of out-migration (Figure 1). In-migration is extremely rare in Palanpur; therefore, the expansion of the population is only due to the natural growth rate. The overall fertility level, expressed here with the child dependency rate has remained very high in time (Fig.2), and the median age has never crossed 20 years old, meaning that children, adolescents and young adults constitute half of the population.

The population of Palanpur is distributed in different jati; the jati or caste is an ascribed form of social affiliation acquired by birth and characterized by endogamy, rigid hierarchy, inheritance of occupation, ritual purity and pollutions rules (Beteille, 1965). No inter-jati mobility is possible, neither by occupational achievement nor by marriage. For the purpose of our analysis, we have grouped all of them into four different categories: we isolate three jatis out of nine - Thakur, Moria and Jatav - and we aggregate the others in a single residual category (Figure 1). Thakur, Moria and Jatav can be seen, in many respects, as the main players in Palanpur's economy and society and they represent three important sections of the rural society of North India. They are the most consistent jati in terms of share of the total population all over the period (constant and around 10-20% each) and the most relevant in terms of differential characteristics.

Thakur, who belong to the general caste group in the administrative scheme, were traditional rulers and warriors and they correspond to the dominant historical caste in the village. In the zamindari system, the feudal system before the land reform, they were the landlords who used to collect revenue in the feudatory estate. They have a great attachment to the notion of *ijjat* (honour), and they are reputed for their marked aversion to manual work.

Moria, registered as other backward caste category, come just after the Thakur in the caste social order; traditionally they were large cultivators but not landlords. They are reputed to have a strong commitment to hard physical work in agriculture. Self-sufficiency is another crucial aspect of Moria, they only consume their self-produced food and milk, and they have a strong aversion to borrowing and lending, especially from private sources.

Finally, Jatav are the ones who stand at the bottom of the hierarchy. In the past they were considered untouchable (dalit) as most of the other jatis falling in the category of the Scheduled Caste and benefiting from the reservation policy implemented by the Nehruvian government: they have always been among the most discriminated by the rest of the population. Indeed, in Palanpur Jatav were the most deprived caste, socially and economically, and mostly working as agricultural labourers in the landlords' fields. Although they all got small parcels of land with the redistributive operations of the land reforms, still many of them are landless: they could not invest much in agriculture because of small capital endowment and the poor quality of the parcels of land they got. Nowadays, they are spatially segregated in the village and live in miserable conditions. They

have an inferior level of education, and they are mainly involved in unskilled manual work; many of them use to go and stay for several months in brick-kilns with all their family at work.

All the jati have experienced a dramatic decrease in the landowning size per household over time, but not at the same pace (Figure 2). Thakur, who accounted for the largest landowners until 1975, are those who lost the most significant amount of land in both absolute and proportional terms; Moria acquired some of the lands sold out by Thakur and became after 1975 the most prosperous landowners in Palanpur. Jatav have lost less land in absolute term, relatively to Thakur and Moria, but they have always held smaller parcels of land per household. Interestingly, after 1984 there is a converging and decreasing trend for all the jati while before 1984 different trends were swinging from a survey year to the other, meaning that in recent decades the whole population is under threat of land shortage with the increasing demographic pressure.

Change in land ownership at the household level is the result of two distinct types of transfers: land market transactions and the process of land fragmentation through land succession. The land market is not very active in Palanpur, and previous studies have shown that the changes in land distribution are really driven by the second type of transfer (Lanjouw and Stern 1998). In other words, the land endowment of a household depends far more on the capacity of the household to keep the ancestral property undivided after the death of the head.

However, we observe in Palanpur an overall increase of partitioning from almost zero cases in 1964 to a quarter of the households in 2009. Partition rose significantly after 1984, but when we look at the partition rate by jati (Figure 4 and Figure 5), we notice that there is not a linear pattern for the whole population. Jatav partition more and their pattern diverges from the ones of Thakur and Moria which are similar. This divergence could be related to the fact that they have smaller landowning, but it is also possible that they follow a different family ethic and they are less attached to the model of joint household. Having never had large landholding, they might value less the land for its function of social marker; instead, they seek for outside non-farm jobs and they are more emancipate from the agrarian social structures. When comparing the child dependency ratio (Figure 6) with the household size (Figure 7) by jati we can see that Jatav tend to have smaller households than Thakur and Moria, but a higher fertility rate, in particular in recent decades. Jatav seem to partition more in nuclear units while keeping a high ratio of child to adults per units; Moria and Thakur appear to have started to control their fertility but they still maintain a joint structure of household. Overall, Thakur is the group who has experienced the most significant change: from large households with high fertility to the smallest average size of household and the lowest fertility in 2009.

Since one of the major differences between the three jati in the trends observed is landowning, we can speculate that the household structure in Palanpur is determined by the size of land ownership and the demographic pressure internal to the household. We hypothesise that landed households would partition less to preserve the ancestral estate and avoid losses in land fragmentation. Concerning landless households, they are expected to partition more because they are under-exposed to the risk of losses with the land inheritance.

5 The determinants of partition: analysis and results

We apply a threefold analysis of the partition determinants. First, we check whether the landowning and fertility levels affect the chances of partition. Second, we estimate the association of landowning and fertility variations with partitioning and third we explore whether there are some caste-specific preferences for partitioning when controlling for fertility, land and other characteristics at individual and household levels.

We estimate the probability to partition at the individual level using a probit model (Table 3). The sample is restricted to males aged from six to fifty (no partitions happened below or above this age range over the observed period). The controls included in the model are both at the individual level - age, education level, marital status, relation to head - and at the household level - status of the previous head, share of sons' wives, share of sons, share of brothers and household size. We measure fertility with the child-dependency ratio per household, the variation of the child-dependency ratio from the previous household status to the next one and the interaction between these two terms. Landowning is measured by the landowning status (landless versus landowner), the landowning size per household, the variation of the landowning from the previous household status to the next one, and the interaction between current landowning level and the variation term. Finally, we control for caste and time (post-1984[4] and time length between each survey).

The results show that partition is less likely to happen with age increasing while education seems to be not significant in the probability to partition, as well as the marital status. Being son or brother increases the chances to partition (Model 1,2,3), and at the household level, the greater is its size, the more partition may happen (Model 1). The share of son's wives is strongly and positively associated with the probability to partition (Model 1, 2, 3): the reason for this association may be the female discords arising between daughters in law as it has other studies have already shown (Caldwell, Reddy and Caldwell, 1984). Indeed, daughters-in-law are the major disputants in joint households because they are the only foreigners of the household and they have to go through a process of uprooting from their original family and village to a situation where their primary relationship is with their sisters-in-law who are competing to gain the benevolence of their mother-in-law. At the opposite, the higher is the share of the head's brothers in the household, the less partition is likely to happen (Model 1,2,3): if the head is living with his brothers in the same household, it means that the household structure has already been assessed as a joint continuation after the death of their father. The share of the head's sons is also correlated with a higher probability of partition, although it is less significant (Model 2).

The nuclear unit who partitions has a higher fertility level than the household of origin (Model 1). This relation suggests that the propensity to partition may be determined by the fact that higher fertility of the current unit compared to other units in the original joint household acts like a push factor. The head of the joint household, or other members involved in the decision-making, may put pressure on the nuclear unit with higher fertility to get out of the household to reduce the internal demographic pressure on the joint estate and future land fragmentation.

Moreover, once the work utility of the children has reached a satisfying level for the family production and the support utility is ensured, the consumption utility of an additional child would weight more and disrupt the internal equilibrium, so that partition is more likely to occur. Another

[4] As observed in the descriptives 1984 is a crucial year because in the following years landowning pace is converging for the whole population.

possible explanation of this association is that partitioning allows the nuclear unit to make fertility choices different from the average fertility of the original household, suggesting that fertility control is higher in a joint family. It is worth to be noted that in some cases when partitioning happens before the death of the former head the rights over land are freeze until the joint household continue to exist or they can even be lost in case of quarrels with the head. In this case, fertility is no longer constrained by the risk of future land fragmentation and the partitioned unit is forced to exit cultivation and convert in alternative means of livelihood.

Further, in Models 2 and 3, we can see that for the same variation of fertility, the higher the fertility of the original household, the stronger is the propensity to partition. This shows that the weight of the children in the previous household increases with their numerosity on the choice to partition because more they are, more they loom over the share of the future inheritance.

Concerning the relationship between landowning and partitioning: we have found a negative association in the model confirming our hypothesis[5] (Model 2,3). The individuals who belong to a landless household are more likely to partition than individuals from landed ones since they have nothing to lose in terms of indivisible assets like land and livestock (Model 1,2,3). Also, landless households are more exposed to non-farm jobs opportunities, which may require to step out of the village (Mukhopadhyay, 2011). Moving out on a temporary or seasonal basis, even if maintaining the residence in Palanpur, can contribute to loosen the ties with the joint family and eventually push some units to live separately.

Conversely, partitioning is less common among individuals belonging to large landholding households, because the rationale is to preserve the indivisibility of the ancestral estate. Indeed, the interaction between the variation of land and the original amount of land (Model 2,3) shows that the larger the landowning of the previous household, the lower the chance of partition[6].

Finally, the positive and significant association between Jatav and the probability to partition confirms the hypothesis of a caste effect which is not related to fertility or landowning. A possible interpretation relates to the fact that owning a large landholding is closely associated with the possession of a large house while in the case of landless, it is widespread to possess a one-room house. Jatav in Palanpur are still spatially segregated in a crowded area and have low standards of housing comfort. The lack of additional rooms and insalubrious conditions of living could motivate a young married couple to set up a separated household. Moreover, Jatav are the main recipient of government provision of loans for the building of cheap additional houses. Their willingness to partition might also have to do with the power of influence that women have in the decision-making of the household.

Jatav women, contrary to Thakurs and Morias, are more common to work outside the family farm and to migrate with their husband in cities for work; they experience more opportunities of empowerment towards the traditional social structures. It has been acknowledged, for example, that Jatav stick less strictly to the norm of arranged marriage: love marriages can arise from the experiences of migration for seasonal work in brick kilns where the social control of the village is

[5] Landowning is calculated per household. Using per capita land owned and land owned per marital unit the relation is still negative and significant.

[6] We estimate the same model including tenancy obtaining the same results. We applied two different definitions: tenancy expressed as the ratio between land leased in and land owned and tenancy as the difference between the land leased in and the land owned. Results are also confirmed when using additional controls for land leased in and leased out.

less (Shah 2006). Love marriage may be an incentive for young couples to set up a separate household, or, in extreme cases of parental disapproval, partition is more than optional but necessary. Moreover, if Jatav women have more decisional power, we can also imagine that the share of son's wives weights more on the propensity to partition compare to other castes.

6 Conclusion

In this contribution, we test the validity of some hypothesis already discussed in the literature on the relationship between household structure, fertility and landowning in agrarian societies. Compare to previous studies, we develop an analysis based on panel data, and we extend the controversial topic of the determinants of the household structure to a context of post-agrarian transition. This case study covers a period of profound social, political and economic transformations which have characterised the Indian rural society of the last half-century.

We assume that a household structure is a strategy to organise production and consumption among the individuals and that the rationale of partitioning rather than maintaining a joint model from one generation to the next depends on several factors. In particular, the intra-household social relations of production, the household orientation to cultivation and the institutional setting, in particular, the inter-caste relations, the predominant household model and the rules of inheritance. Finally, we assume that the land market is still not very active in rural India, and most of the land transactions are inter-kin transactions due to land succession.

We measure the relation between partition, fertility and landowning with a probit model estimating the probability to partition at the individual level controlling for a set of individual and household characteristics. We also estimate the effect of time and caste.

We find that landowning negatively affects the probability to partition, possibly because of households with large landowning may be averse to land fragmentation. Following the same rationale, the results on fertility and partitioning show that those units experiencing high fertility are more likely to partition, suggesting that fertility control is higher in joint households.

Moreover, the share of sons' wives is a factor affecting strongly the decision to partition, because of female conflicts frequently in the joint households. Moreover, our estimates show the existence of caste-specific preference for partition in the case of Jatav. This last finding requires additional research to identify the reasons for Jatav to act like path-breaker by getting rid, more than others, of the predominant model of joint household.

7 Tables and figures

Figure 1: Total population and population shares by caste (jati) 1958-2009

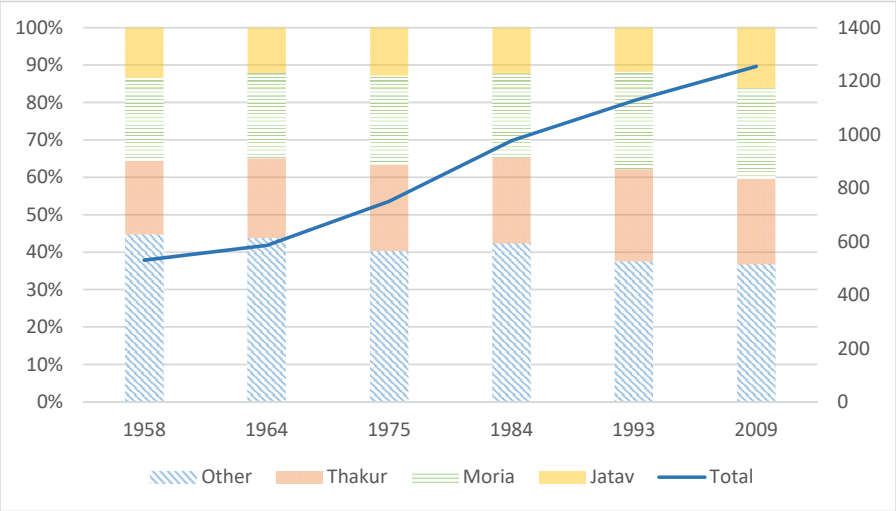


Figure 2: Average owned land per household by caste (jati) 1958-2009

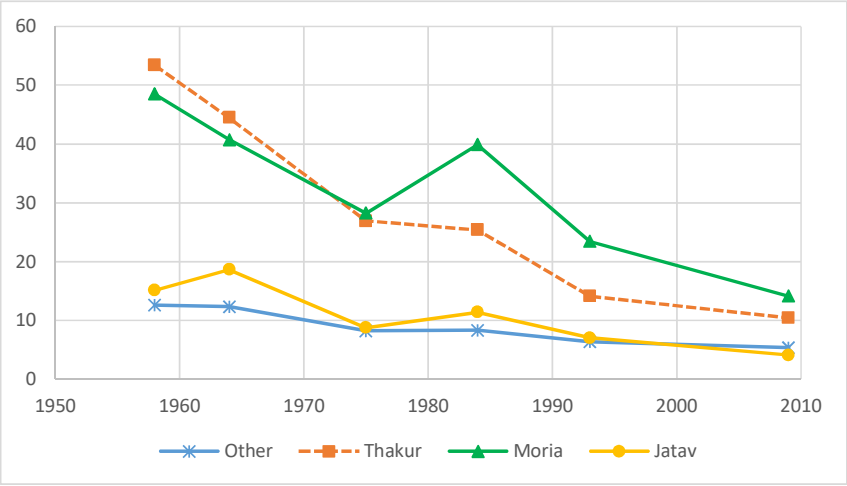


Figure 3: Number of households by caste (jati) 1958-2009

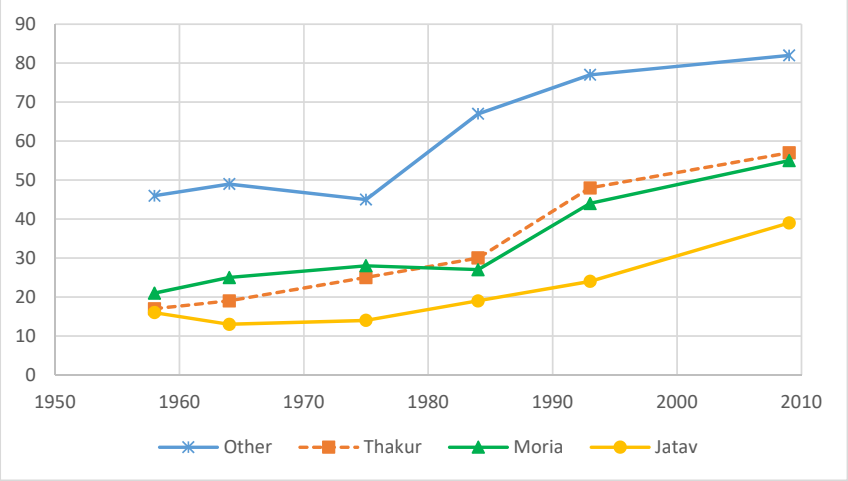


Figure 4: Household partition rate by caste (jati) 1958-2009

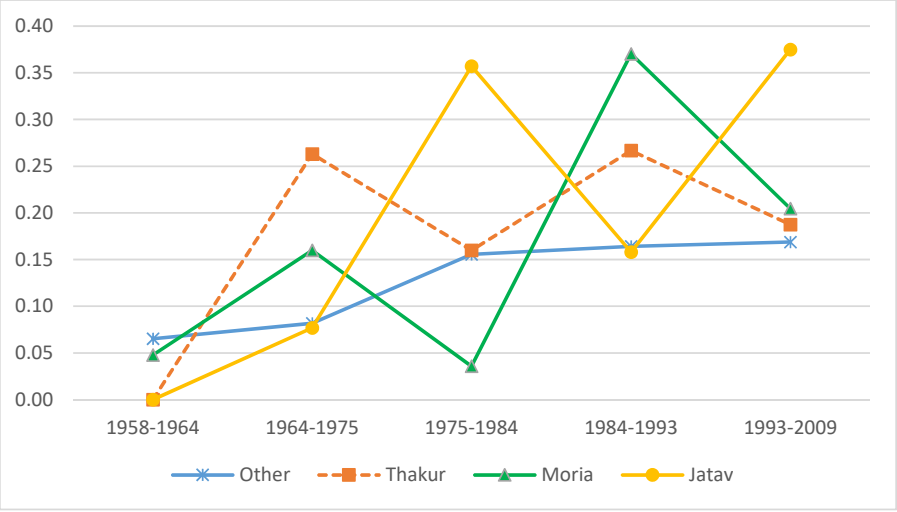


Figure 5: Individual partition rate by caste (jati) 1958-2009

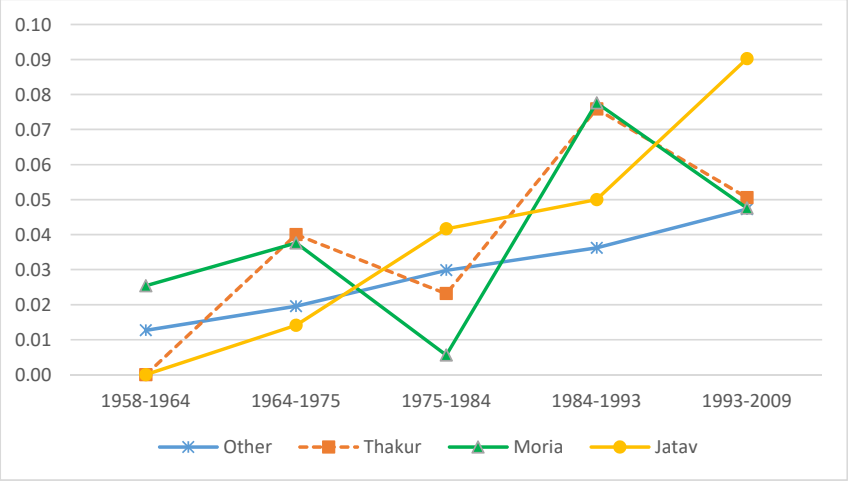


Figure 6: Child dependency ratio (less than five years old) by caste (jati) 1958-2009

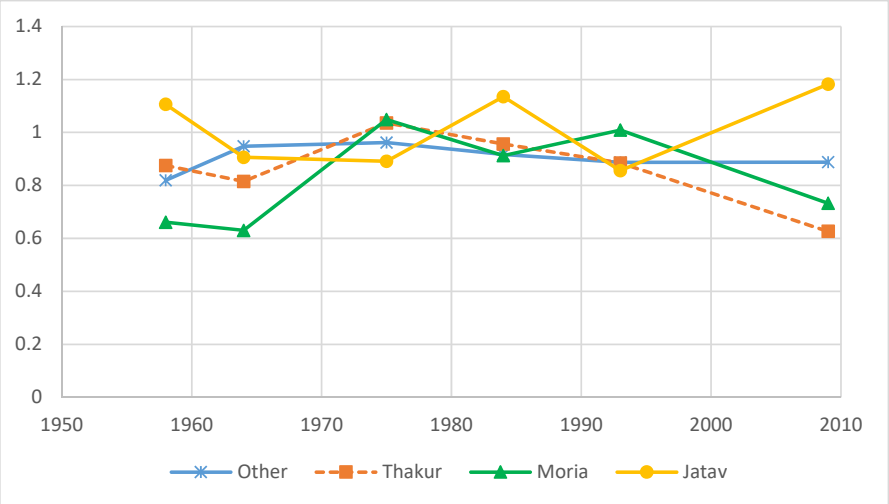
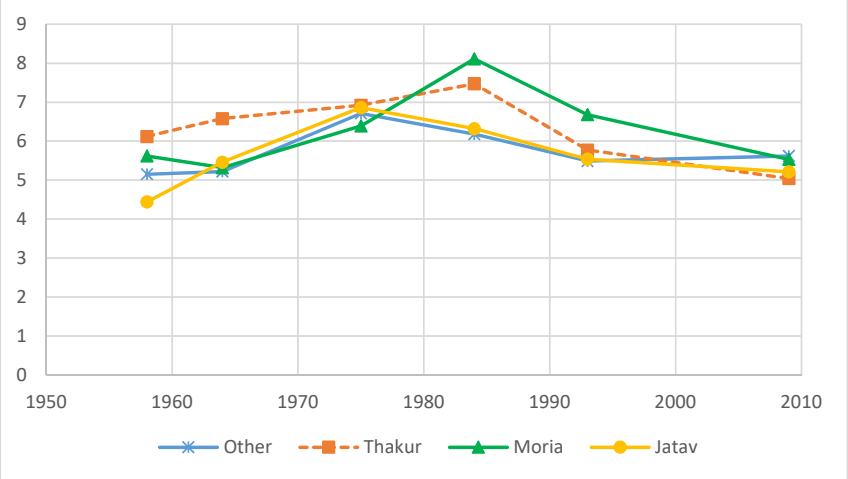


Figure 7: Average household size by caste (jati) 1958-2009



7.1 Descriptives

Table 1: Descriptives by caste (jati) at individual level

	Others		Thakur		Moria		Jatav	
	pre84	post84	pre84	post84	pre84	post84	pre84	post84
age	21.6	21.7	23.1	20.3	22.8	20.5	22.4	21.5
	(12.5)	(12.5)	(13.1)	(10.9)	(12.3)	(11.8)	(13.2)	(12.4)
high education	0.046	0.073	0.10	0.23	0.11	0.23	0	0.011
	(0.21)	(0.26)	(0.30)	(0.42)	(0.31)	(0.42)	(0)	(0.10)
married	0.45	0.43	0.53	0.40	0.55	0.47	0.47	0.44
	(0.50)	(0.50)	(0.50)	(0.49)	(0.50)	(0.50)	(0.50)	(0.50)
son	0.55	0.63	0.53	0.55	0.47	0.50	0.66	0.53
	(0.50)	(0.49)	(0.50)	(0.50)	(0.50)	(0.50)	(0.48)	(0.50)
brother	0.069	0.031	0.072	0.14	0.089	0.11	0.012	0.086
	(0.25)	(0.17)	(0.26)	(0.35)	(0.29)	(0.31)	(0.11)	(0.28)
Observations	216	192	139	141	146	150	85	93

mean coefficients; sd in parentheses

N=1,164 individuals.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 2: Descriptives by caste (jati) at hh level

	Others		Thakur		Moria		Jatav	
	pre84	post84	pre84	post84	pre84	post84	pre84	post84
previous head died/migrated	0.22	0.24	0.20	0.33	0.045	0.36	0.21	0.28
	(0.42)	(0.43)	(0.41)	(0.49)	(0.21)	(0.49)	(0.42)	(0.46)
share of sons's wives	0.040	0.065	0.081	0.018	0.017	0.048	0.060	0.060
	(0.073)	(0.11)	(0.095)	(0.051)	(0.054)	(0.076)	(0.097)	(0.084)
share of sons	0.28	0.31	0.27	0.31	0.23	0.26	0.31	0.33
	(0.19)	(0.17)	(0.20)	(0.19)	(0.17)	(0.22)	(0.18)	(0.20)
share of brothers	0.041	0.014	0	0.077	0.036	0.057	0.0088	0.074
	(0.11)	(0.053)	(0)	(0.20)	(0.097)	(0.14)	(0.038)	(0.16)
household size	6.22	7.51	6.70	6.83	5.27	6.32	5	6.33
	(2.27)	(3.01)	(3.50)	(3.70)	(2.55)	(2.63)	(1.89)	(1.75)
landless	0.098	0.19	0.050	0.056	0	0	0	0.056
	(0.30)	(0.40)	(0.22)	(0.24)	(0)	(0)	(0)	(0.24)
land	15.3	11.0	41.3	21.5	40.5	31.1	13.6	10.6
	(12.6)	(11.6)	(37.6)	(21.0)	(25.9)	(20.1)	(10.8)	(6.60)
Δ land	-0.21	-0.10	0.12	-0.15	-0.12	-0.30	0.056	-0.53
	(1.08)	(1.32)	(0.61)	(0.82)	(0.47)	(0.63)	(0.87)	(0.96)
child ratio	0.84	1.01	0.74	0.87	0.73	0.73	0.80	0.81
	(0.62)	(0.68)	(0.55)	(0.46)	(0.55)	(0.52)	(0.66)	(0.55)
Δ child ratio	-0.0019	-0.55	0.018	-0.75	0.045	0.044	-0.042	-0.16
	(1.01)	(1.06)	(1.15)	(1.12)	(1.24)	(1.23)	(1.34)	(1.37)
Observations	41	37	20	18	22	22	19	18

mean coefficients; sd in parentheses

N=137 households.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

7.2 Estimation results

Table 3: Determinants of household partition at individual level.

	(1)		(2)		(3)	
y: individual partition at t+1						
Individual level						
age	-0.0212**	(0.026)	-0.0252**	(0.018)	-0.0235**	(0.026)
high education	0.285	(0.122)	0.222	(0.257)	0.262	(0.190)
married	0.248	(0.274)	0.279	(0.223)	0.263	(0.257)
son	1.093***	(0.000)	1.212***	(0.000)	1.234***	(0.000)
brother	3.831***	(0.000)	4.146***	(0.000)	4.149***	(0.000)
Household level						
previous head died/migrated	0.0546	(0.716)	0.00125	(0.993)	0.0396	(0.785)
share of sons's wives	3.187***	(0.003)	2.957**	(0.015)	2.729**	(0.027)
share of sons	0.975	(0.154)	1.081*	(0.099)	1.103	(0.103)
share of brothers	-3.663***	(0.002)	-4.267***	(0.000)	-4.311***	(0.000)
household size	0.0441**	(0.025)	0.0341	(0.131)	0.0372	(0.119)
Fertility						
child ratio			-0.0732	(0.754)	-0.0925	(0.700)
Δ_t^{t+1} child ratio	0.172**	(0.019)	-0.0115	(0.915)	-0.0200	(0.855)
child ratio $\times$ Δ_t^{t+1} child ratio			0.287**	(0.035)	0.287**	(0.041)
Land						
landless	3.078***	(0.000)	1.855***	(0.001)	2.073***	(0.000)
land			-0.0230***	(0.003)	-0.0217***	(0.006)
Δ_t^{t+1} land	-1.202***	(0.000)	-0.766***	(0.000)	-0.819***	(0.000)
land $\times$ Δ_t^{t+1} land			-0.0250***	(0.000)	-0.0233***	(0.001)
Caste						
Thakur					0.0266	(0.890)
Moria					0.201	(0.313)
Jatav					0.362*	(0.096)
Time						
year $\geq$ 1984	0.355**	(0.035)	0.320*	(0.065)	0.289	(0.109)
years between surveys	0.0604**	(0.016)	0.0663***	(0.009)	0.0626**	(0.015)
Obs	1162		1162		1162	
Pseudo-R^2	0.498		0.524		0.528	

p-values in parentheses

Years = 1958, 1964, 1975, 1984, 1993, 2009. Standard errors are clustered at household level. All variables in level at time t. Changes of owned land and child dependency ratio (<5 years) (i.e. Δ_t^{t+1}) represent the difference between the value at t+1 (i.e. the value of the original household for people that do not partition, while it refers to the value of the new household set by the partitioning individual) and the value of the original household at t.

* p<0.10, ** p<0.05, *** p<0.01

References

Caldwell, J. C. (1976): "Toward a restatement of demographic transition theory," *Population and development review*, pp. 321–366.

Caldwell, J. C., P. H. Reddy, and P. Caldwell (1984): "The determinants of family structure in rural South India," *Journal of Marriage and the Family*, pp. 215–229.

Chayanov, A. V. (1966): "On the theory of non-capitalist economic systems," *The theory of peasant economy*, pp. 1–28.

Coomes, O. T., F. Grimard, and V. Diaz (2001): "Peasant farm size and family size: a causality analysis from the Peruvian Amazon," in *NEUDC Conference, Boston, MA*.

Das Gupta, M. (1995): "Fertility decline in Punjab, India: parallels with historical Europe," *Population Studies*, 49(3), 481–500.

De Janvry, A., and C. Garramon (1977): "The dynamics of rural poverty in Latin America," *The Journal of Peasant Studies*, 4(3), 206–216.

Doveri, A. (2000): "Land, fertility, and family: A selected review of the literature in historical demography," *Genus*, pp. 19–59.

Dumont, L. (1980): *Homo hierarchicus: The caste system and its implications*. University of Chicago Press.

Foster, A. D. (1993): "Household partition in rural Bangladesh," *Population Studies*, 47(1), 97–114.

Freed, S. A., and R. S. Freed (1982): "Changing family types in India," *Ethnology*, 21(3), 189–202.

Hazan, M., and B. Berdugo (2002): "Child labour, fertility, and economic growth," *The Economic Journal*, 112(482), 810–828.

Hazell, P. B., C. Poulton, S. Wiggins, and A. Dorward (2007): *The future of small farms for poverty reduction and growth*, vol. 42. Intl Food Policy Res Inst.

Hiday, V. A. (1978): "Migration, urbanization, and fertility in the Philippines," *International Migration Review*, 12(3), 370–385.

Kolenda, P. (1987): *Regional differences in family structure in India*. Jaipur: Rawat Publications.

Krishnaji, N. (1984): "Family size, levels of living and differential mortality in rural India: some paradoxes," *Economic and Political Weekly*, pp. 248–258.

Lanjouw, P., N. Stern, et al. (1998): "Economic development in Palanpur over five decades," *OUP Catalogue*.

Levine, N. (1977): *The Nyinba, population and social structure in a polyandrous society*. University of Rochester.

Mandelbaum, D. G. (1974): *Human fertility in India: Social components and policy perspectives*. Univ of California Press.

Medick, H. (1976): "The pro to-industrial family economy: The structural function of household and family during the transition from peasant society to industrial capitalism," *Social history*, 1(3), 291–315.

Millar, J., and A. Warman (1996): "Family obligations in Europe," .

Nagarajan, R., and S. Krishnamoorthy (1992): "Landholding and fertility relationship in a low-fertility agricultural community in Tamil Nadu.," .

Oldenburg, P. (1992): "Sex ratio, son preference and violence in India: A research note," *Economic and Political Weekly*, pp. 2657–2662.

Ram, M., and R. Wong (1994): "Covariates of household extension in rural India: Change over time," *Journal of Marriage and the Family*, pp. 853–864.

Rawal, V. (2008): "Ownership holdings of land in rural India: Putting the record straight," *Economic and Political Weekly*, pp. 43–47.

Schutjer, W. A., C. S. Stokes, and J. R. Poindexter (1983): "Farm size, land ownership, and fertility in rural Egypt," *Land Economics*, 59(4), 393–403.

Shah, A. (2006): "The labour of love: Seasonal migration from Jharkhand to the brick kilns of other states in India," *Contributions to Indian Sociology*, 40(1), 91–118.

Sharma, H. (2007): "Land distribution and tenancy among different social groups," *Economic and Political Weekly*, pp. 4183–4185.

Stokes, C. S., and W. A. Schutjer (1984): "Access to land and fertility in developing countries," .

Strauss, J., and D. Thomas (1995): "Human resources: Empirical modeling of household and family decisions," *Handbook of development economics*, 3, 1883–2023.

Swartzberg, L. (1979): *The north Indian peasant goes to market*. Motilal Banarsidass Publishe.

Vlassoff, C. (1990): "The value of sons in an Indian village: How widows see it," *Population studies*, 44(1), 5–20.