

Manorialization and population growth by landlord types and landscape regions in
Medieval England

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Abstract

This paper examines the diverse processes of manorialization and population growth by landlord types and landscape regions in thirteenth century England. Factor analysis (maximum likelihood estimation and promax rotation) of the data from the Hundred Rolls identify three factors: classical structure, freedom, and demographic pressure. Manorialization characterized by the first two approximately independent factors differs by landlord type. Highly manorialized parishes were mainly occupied by the earlier-established ecclesiastical estates, while earls' estates were relatively prominent in parishes where classical structures developed but free tenements were dominant. This study also reveals that many parishes were highly manorialized in the western and eastern champion regions of the Midlands and Chiltern. Furthermore, the factor of demographic pressure revealed other regional differences. While parishes in the western and eastern champion Midlands were manorialized in a similar way, the eastern part faced greater population pressure. However, the pressure in this region was still less than that in the south-eastern champion, and the East Anglian Heights. In the eastern champion Midlands, the size of villein holdings could be maintained, while in the latter two regions, villein plots fragmented and the number of free small tenements increased.

1. Introduction

It is well known that several types of landlords built their estates in thirteenth century England. Furthermore, recently, archaeological and historical studies have revealed a variety of field systems and settlements in medieval England (Lewis et al., 2001; Robert and Wrathmell, 2002; Williamson, 2003; Jones and Page, 2006). However, the relationships among lordship types, landscape regions, manorialization, and population growth remain to be examined. Thus, I examine the diverse processes of manorialization and population growth by landlord types and landscape regions through specific measurements. The Hundred Rolls of 1279-80 registered tenements with their landlords and covered the areas of the champion Midlands, 'sheep-corn' lands, and woodland; therefore, the Hundred Rolls will provide appropriate information to help examine how manorialization proceeded and population increased in each landlord's estate and landscape region. However, before analyzing the data, it is necessary to re-examine the manner in which manorialization and population growth may be measured. Although many historians continue to refer to these concepts, there is no agreement on the methodologies to measure them.

A priori, manorialization should not be assumed to be a single-dimensional process. Today, it is well known that 'classical manors' were not universal in medieval England. Kosminsky (1956) showed that the dominance of demesne and servile tenancy, the coincidence of manor and 'vill', and the maintenance of large villein holdings were not common features of manors. However, to understand the process of manorialization

more clearly, it is vital to solve the following two problems at the outset. First, how were the various features of classical manors related to each other in every parish? It is usually implicitly assumed that manorialization was a single-dimensional process. Therefore, how an estate was manorialized is decided by how different the estate was from the ideal type of classical manor. Kosminsky (1956, p.69) asked: "To what extent do the manors ... correspond to the classical characterization of a "classical" manor?" However, the various manorial features should not necessarily been reduced to one single measurement. To analyze the difference of manorialization according to the types of landlords and landscape regions, I would need a chart that can measure several aspects of manorialization. Second, I inquire what effect population increase had on manorialization and vice versa. It is often assumed that population growth was restrained in highly manorialized villages. In a study of nineteenth century England, Milles (1980) contrasted the 'close' townships with large estates and low population density with the 'open' villages with many small proprietors and high population density. This divergence did not emerge newly in that century. There are enough reasons to 'look for the origins of village differentiation long before the nineteenth and even before the seventeenth century' (Milles, 1980, p.107). Indeed, in the Middle Ages, in many old settled areas where classical manors were established, it is often said that population growth stagnated since 'the inhabitants of villages must have been sending many of their younger sons and daughters into colonizing districts or towns as their opportunities at home for acquiring land and a living were limited' (Lewis et al., 2001, p.182). However, on the other hand, the development of the classical manor is sometimes related to population growth. The reason 'landlords should have found direct exploitation of their demesnes easier and more profitable' lies in the decline of 'real

wages' due to abundant supplies of labour caused by the continuous increase in the population (Postan, 1972, p.111). Therefore, it is not certain whether manorialization always accompanied the stagnation in population growth.

Thus, in order to comprehend the process of manorialization and population growth in each landscape region, I propose to distinguish several aspects of classical manors and examine how manorialization and population growth were related depending on the types of lordship and landscape regions. Section 2 introduces the source documents and divides the research area into six landscape regions on the basis of recent archaeological and historical studies. Using factor analysis, Section 3 identifies three factors, which explain the patterns of the correlations between the observed variables of manorial features and population growth. Section 4 examines how the factor scores of manorial features differ according to the types of landlords, and Section 5 analyzes regional differences in manorialization and demographic pressure.

2. Data sources and landscape regions

2.1. The Hundred Rolls and the unit of analysis

The Hundred Rolls of 1279-80¹ registered approximately 18.0 thousand unfree and free 16.4 thousand tenements in 447 parishes in northern Bedfordshire, northern Buckinghamshire, Cambridgeshire, Huntingdonshire, Oxfordshire, and Warwickshire. The documents registered each tenement by vill. Furthermore, they specified the

¹ Illingworth and Caley (1818) and John (1992). See also Kanzaka (2002).

landlord of each land. In this research, however, I analyze the date by neither manors nor vills but by 'parish'. First, 'manor' is not a proper unit for this analysis, since it is so difficult to decide whether a group of tenements comprises a manor. A 'typical' manor coincided with a village and consisted of the landlord's demesne, customary tenements, and free holdings. It is well known, however, that such manors were not common (Maitland, 1897, pp.129-150; Kosminsky, 1956, pp.68-151). When he examined manors and vills in the Domesday Book, Maitland (1897) deplored how problematic it was to define 'manor'. In King Edward's day, for instance, four hides of Orwell (Cambs.) were divided among the King, the Archbishop, three earls, two royal marshals, a lady, and the Church of Chatteris; of the nine estates, six were one and a third virgate or less (Maitland, 1897, p.129). Is it correct to specify these small groups of tenements as a 'manor'? As to the same parish, the Hundred Rolls state that Roger Thornton and Philip St. Clowe held just around sixty and forty acres respectively in 1279-80; both estates included the holdings of villeins and cottagers (Illingworth and Caley, 1818, p.559). Again, are these estates 'manors'? In both cases, I answer in the affirmative. In this article, I consider that small estates, like those in Orwell, are 'manors'. However, this is not determinate. Someone might insist that the estates of Roger Thornton and Philip St. Clowe are too small to be called 'manors'. However, it is impossible to arrive at concrete criteria for judging whether a set of holdings may be referred to as a manor; hence, our decisions about manors remain tentative. Such an indefinable concept is not appropriate as the unit of analysis. Indeed, even Kosminsky thought so; he excluded 'extra-manorial' elements from his analysis (Kosminsky, 1956, p.72). Nevertheless, he did not supply clear-cut criteria for what could be classified as a manor. Without a precise definition of the term, such classifications would inevitably become arbitrary.

Therefore, I simply assume that all the tenements in the Hundred Rolls belonged to certain manors and include all of them in my analysis.

Second, vill does not serve as an appropriate unit of analysis, because a 'villa' or 'hamletta' in the Hundred Rolls sometimes refers to just one settlement of a dispersed village. While a vill generally coincided with a parish, it was not so in all cases. In fact, the Hundred Rolls recorded 156 parishes (34.9%), which included several vills. For instance, the Hundred Rolls recorded the tenements in the 'vill' of Eynesbury and the 'hamlets' of Hardwick, Caldecote, and Weald separately (Illingworth and Caley, 1818, pp.669-71). The one vill and three hamlets in question were very closely related and composed the parish of Eynesbury (Hunts.). Thus, in this case, 'parish' is a more appropriate unit of calculation. The descriptions in the Hundred Rolls seem to be useful for analyzing the patterns of settlements. However, the documents do not record all the settlements. For example, many 'subsidiary settlements' and 'isolated farms', revealed by recent archaeological research in south-western Cambridgeshire (Williamson, 2003, pp.72-7), are not mentioned in the Hundred Rolls. Thus, the Hundred Rolls do not provide enough information to analyze settlements. This insufficiency is another reason for my not using 'settlement' as the unit of calculation.

Furthermore, in the following cases, a group of parishes is regarded as the unit of analysis. First, the Hundred Rolls stated that some vills or hamlets belonged to another vill. Holm was 'a hamlet pertaining to Glatton' (Illingworth and Caley, 1818, p.652). The tenements at St. Ives, Woodhurst, and Oldhurst were registered together under the title 'Slepe cum Wodehirst & Woldhirst' (Illingworth and Caley, 1818, p.603). Second,

landlords sometimes expanded their estates beyond the border of parishes and managed them as a single manor. For example, the villeins on the Bishop of Lincoln estate at Easton, Stow Longa, Little Catworth, and Barham (Hunts.) owed labour services although there were not demesnes in these parishes; they must have performed the services on the demesne at Spaldwick (Illingworth and Caley, 1818, pp.615-6). Similarly, the villeins on Thorney Abbey estates at Farcet cultivated the demesne at Stanground (Hunts.); those on the Bishop of Winchester estate at Hailey, Crawley, Curbridge, and Caswell worked at Witney (Oxon.); those on the Earl of Cornwall's estates Warborough worked at Benson (Oxon.) (Illingworth and Caley, 1818, pp. 645-6, 703-5, and 751); and those on the Bishop of Coventry estate at Gaydon worked at Chadshunt (Warw.) (John, 1992). Thus, I regard a combination of parishes as the unit of analysis. Third, Domesday vills sometimes included several parishes. For example, the Domesday Book vill of Banbury (Oxon.) included three parishes of Banbury, Swalcliffe, and Charlbury; furthermore, the each parish had several Hundred Rolls vills. Since this research examines the data from the Domesday Book together with that from the Hundred Rolls, the unit of analysis must be equal to or larger than a Domesday vill. Therefore, I regard eighteen groups of parishes that had been included in the same Domesday vill as a unit of analysis.³

2.2. Landscape regions

'The material preserved in the Hundred Rolls' primarily covers the 'southern Midlands' (Kosminsky, 1956, p.69). However, the area covered by the documents expanded beyond

³ Appendix A lists the parishes consisting of plural Hundred Rolls vills.

the Midlands. On the basis of the archaeological and historical studies of Williamson (2003), the area is classified into ‘champion Midlands’, ‘south-eastern champion’, ‘East Anglian Heights’, and ‘Chiltern’. In addition, I classify the ‘champion Midlands’ into its western and eastern parts, and I also add another region called ‘the Forest of Arden’ in Warwickshire, which Williamson’s study did not cover. We thus have six regions. First, the western champion Midlands had 243 parishes in Buckinghamshire, Oxfordshire (except Chiltern), and the Feldon in Warwickshire. As Williamson (2003, p.65) noted, ‘By the thirteenth century this was classic champion countryside’. Second, the eastern champion Midlands included 55 parishes in the hundreds of Normancross, Hurstingstone, and Leightonstone of Huntingdonshire. Since this region is located at the edge of the champion Midlands in the face of Peat Fens, it would be worthwhile to examine whether this region was different from the core of the Midlands. Third, the south-eastern champion Midlands was categorized by Williamson (2003, p.72) as a ‘distinct zone exhibiting both “woodland” and “champion” characteristics’. It embraced 78 parishes in west Cambridgeshire, southern Huntingdonshire, and much of northern and eastern Bedfordshire. In this region, the field systems and pattern of settlement deviated from the Midland norm; two- or three-field systems were remodelled by ‘more “irregular” agreements’, and many parishes included ‘isolated hamlets and farms as well as nucleated villages’ (Williamson, 2003, pp.72, 74). Fourth, the East Anglian Heights, covering 39 parishes in south Cambridgeshire, was included in sheep-corn land.⁴ The medieval landscape of this region was very different from that of the

⁴ Ashley cum Silverley, Cherry Hinton, Horseheath, and West Wickham could have been included in ‘East Anglian Boulder Clay’. However, since four parishes are too small to make up an independent region, I include them in the East Anglian Heights.

Midlands; 'open fields were seldom ploughed in ridges' and the field system 'often deviated markedly from the familiar two- or three-field Midland norm'; furthermore, 'villages were generally less compact, much more "polyfocal" in plan' (Williamson, 2003, pp.79, 82). Fifth, Chilterns including 17 parishes in southern Oxfordshire (Roden and Baker, 1966) was also a part of sheep-corn land. In this region, a large amount of woodland and waste was cleared; however, 'the medieval landscape of the Chilterns continued to be characterized by vast areas of managed woodland, open commons and common wood-pastures' (Williamson, 2003, p.110). Finally, the Forest of Arden, covering the north of River Avon in Warwickshire, embraced 15 parishes. It is well known that 'in the Arden country there was still much of the ancient woodland untouched. Settlements tended to be more scattered', furthermore 'although there was some open-field cultivation, enclosures were much more common' (Hilton, 1975, p.122).

Table 1 shows the total acreages of villein tenements, cottagers, and large and free holders in the six regions. Note that the acreage comprises only arable field and meadow. The pasture, woods, and wastes are excluded for two reasons. First, I calculate the acreage of individually held and intensively utilized land. Peasants harvested crop on their arable land and mowed hay on their meadow, while they held pasture, woods, and wastes in common and exploited them generally in a more extensive way. Second, the Hundred Rolls often showed the existence of pasture, woods, or wastes, but did not indicate their acreage. Thus, to compare the size of several parishes, I eliminate lands that were not precisely measured.

The Hundred Rolls, in principle, classified peasants into villeins, cottagers, and free

holders.⁵ The villeins usually held one or half virgate; in many cases, one virgate was 25 or 30 acres. However, in some parishes, villein tenements were divided into smaller plots. For example, on Philip de Colville's manor at Lolworth (Cambs.), 22 peasants held five acres in villeinage, and they performed labour services, including ploughing. The five acres seem to have been a quarter virgate, where one virgate was 20 acres. I could not locate a smaller plot held in villeinage in the Hundred Rolls; therefore, five acres may be regarded as the lower limit for villein tenements. Hilton (1983, p.15) also adopted this criterion: 'small holdings which in a large number of cases must have been under five acres'. Then, I categorize unfree tenants of the lands under five acres as cottagers and classify the free lands into large and small tenements according to the same criteria.

⁵ The Hundred Rolls also registered 'sokeland', 'sokeman', 'free sokemen', or lands held in 'socage' in Swavesey, Fen Drayton, Swaffham Prior, Soham (Cambs.), Brampton, Alconbury (Hunts.), Neithrop, Woodcote, Benson, Great Tew, Hanborough (Oxon.), and Finham in Stoneleigh (Warw.) (Illingworth and Caley, 1818, pp.470-1, 475, 484-5, 501, 608-13, 706, 751-4, 846, 871-2; John, 1992, p.69). I classify these lands as free tenements. However, I regard 'bond sokemen' or 'serf sokemen' in Brampton (Hunts.), Crowmarch, and Stoke Basset (Oxon.) (Illingworth and Caley, 1818, pp.608-9, 774, 780) as unfree.

3. Factor analysis of features of manorial structures

3.1. Features of manorial structures

I consider the following features of the manorial structure of each parish: the extent of coincidence between a manor and a parish (COIN), the self-weighted means of the acreage of manors (MANR), the proportion of the acreage of free holdings (FREE), the average acreage of villein tenements (VILN), the number of cotlands (COTL), the average acreage of large free tenements (FRLG), the number of small free tenements (FRSM), and the number of burgages (BURG). These indexes are explained in detail below.

COIN shows the extent to which a parish coincided with a manor. COIN is defined as the sum of the squares of the shares of individual manors in the parish, or in mathematical notation as

$$\text{COIN} = \sum_{i=1}^n S_i^n$$

where S_i is the share of the land of individual manor i , and n is the number of manors.

COIN is similar to the Herfindahl–Hirschman Index (HHI). HHI was originally invented by Hirschman (1945) and modified by Herfindahl (1950) to measure market concentration. Thus, COIN measures to what degree the land in a parish was concentrated in one or more manors. When one landlord ‘monopolized’ the land of a parish, the manor coincided with the parish; then, COIN takes the value 1.0, which is the maximum value of the index. When a parish is equally divided among two and three manors, COIN takes the value 0.5 and 0.33 respectively. Interestingly, the index would

increase as the landlords divided a parish unequally. For example, if two manors occupied 90 and 10 percent of half a parish, COIN would be 0.82; this value exceeds the value of COIN when a parish is equally divided. Thus, COIN is suitable for measuring the level of coincidence between a manor and a parish.

Furthermore, COIN serves another appropriate function for this research; the index does not vary considerably as per the number of 'small manors'. As previously noted, it is sometimes disputable whether a small group of tenements can be regarded as a manor. However, such arguable decisions have a limited influence on the result of my analysis, since small changes in manor share do not affect COIN significantly. For the above-mentioned example of Orwell (Cams.), there were six groups of tenements with sizes varying from 467 to 38 acres. When I regard all the groups as manors, COIN is 0.30. On the other hand, when I exclude the smallest two groups, COIN becomes 0.36; the index increases by 20 percent only. In contrast, when excluding the two such small groups, the arithmetic average of the shares changes from 0.17 to 0.25, or increases by 50 percent. Therefore, COIN reflects the variation in prominent manors more suitably than a simple arithmetic average.

MANR is defined as the self-weighted average of the size of manors, or mathematically as

$$\text{MANR} = \frac{\sum_{i=1}^n M_i^2}{\sum_{i=1}^n M_i}$$

where M_i is the acreage of individual manor i . Note that MANR is the product of COIN and the acreage of the parish. Therefore, MANR is also not too sensitive to the decision of whether a group of tenements constitutes a manor. Furthermore, the self-weighted

mean clearly reflects the difference between the sizes of individual manors (Lann and Falk, 2005). The more disparate (unequal) the division of a parish, the more the increase in MANR. In contrast, the arithmetic average does not change at all with the difference in manorial acreage. Therefore, instead of the arithmetic average, MANR provides a more suitable representation of the manorial acreage of a parish.

FREE shows the proportion of acreage of free tenements in a parish. Kosminsky (1956, p.68) stated that demesne and 'the land of the peasant serfs' are 'two basic parts' of a manor, while 'the free holdings ... make up "a narrow fringe" on the territory of the manor'. He thus assumed that classical manors were dominated by demesne and villein holdings; thus, the low value of FREE is another index of manorialization.

VILN represents the extent to which villein holdings were divided. That is, it is the arithmetic average size of unfree tenements of five acres or more. COTL is the number of cotlands, or unfree tenements of less than five acres. I use the same calculation for free holdings. FRLG is the arithmetic average size of free tenements of five acres or more, and FRSM is the number of free tenements less than five acres. Note that the number of free tenements is not equal to the number of free tenants. On one hand, free tenants could number fewer than the tenements, since one freeman often held several free tenements in the same parish. On the other hand, there could be more peasants than tenements, since the free tenants recorded in the Hundred Rolls sometimes sublet the land to others.⁷ Thus, the number of free holders could depart from that of free

⁷ At times, the Hundred Rolls mentioned subtenants. For example, on the manor of John Tingewick in Thornton (Bucks.), William Sadela held one virgate for life from

tenements in both directions. Finally, BURG is the number of burgages. The Hundred Rolls registered burgesses in parishes such as Glatton (Hunts.) and Witney (Oxon.).⁸ Furthermore, although the documents do not mention it, the towns of Banbury and Thame had 192 and 63 burgesses respectively (Lobel, 1962, p.179; Crossley, 1972, p.18). Thus, the above-mentioned eight variables describe the manorial features of each parish.

3.2. Factor analysis

Table 2 shows the correlations between the observed variables of the manorial features. Factor analysis (maximum likelihood estimation) is conducted to identify unobserved variables called factors, which explain the patterns of the correlations. Then, I obtain three factors with eigenvalue greater than one, which cumulatively explain 47.6 percent of the variation in the data. The result of factor loading after promax rotation is shown in Table 3, with the highest factor loading for each variable appearing in bold.⁹ The variables that load on Factor 1 are MANR, COIN, and BURG, with the first two representing the features of classical manors. In the parishes with a high score for Factor 1, there was a strong tendency for one great manor to cover a whole or a large part of a parish. Hence, Factor 1 is labelled 'classical structure'. Furthermore, the fact

Snelshall Priory for 12s., while the priory held the land for 4s. (Illingworth and Caley, 1818, p.352).

⁸ In Kimbolton (Hunts.), 59 tenements of 'burgesses and cottars' were registered together. I classified them as burgesses (Illingworth and Caley, 1818, pp.621-2).

⁹ Appendix B shows the factor scores and the manorial features of each parish.

that BURG loads high on this factor means that burgage tenure developed mainly in manors with classical structures. However, another characteristic of manorialization, namely the small proportion of free holdings, scarcely contributes to this factor. In contrast, FREE loads fairly strongly on Factor 2, which is labelled 'freedom'.

The factors of 'classical structure' and 'freedom' are approximately independent of each other. It is usually assumed, explicitly or implicitly, that manorial organizations with classical structures held a higher portion of villein holdings. For instance, since Kosminsky *a priori* supposed that villein holdings were dominant in large classical manors, he regarded 'the low percentage of villein land on large manors' as 'structural peculiarities' (Kosminsky, 1956, pp.99-102). However, Table 4 shows that the correlation coefficient between the two factors is only -0.190. Thus, manorialization should be regarded as a *two-dimensional process* consisting of two nearly independent factors. In this framework, I do not consider parishes with large manors and many freeholders as being peculiar, but rather, I believe that this merely the result of high factor scores for classical structure and freedom.

Factor 3 is labelled 'demographic pressure', since VILN and FRLG load positively on that factor, and COTL and FRSM, negatively. Note that the *lower* the factor score, the greater the increase in pressure. Low Factor 3 scores indicate that large unfree and free holdings were divided, and the number of small unfree and free holdings increased. Usually, population density is employed to measure the effect of population growth. Factor 3 is another scale of this measurement. While population density sums up the entire population (free and unfree) and the size of their land (large or small), Factor 3 is

calculated by weighting each item differently. As expected, these two indexes are fairly correlated. If I assume the number of tenements as 'population', the absolute value of the correlation coefficient between population density and Factor 3 is as high as 0.69. Thus, the two measurement indexes can be utilized complementarily. Furthermore, it is important to note that the factor of demographic pressure correlates only slightly with the factors of classical structure and freedom; as Table 4 shows, the correlation coefficient of Factor 3 with Factors 1 and 2 is only 0.306 and -0.195 respectively. Table 5 shows the factor scores of the six regions.

In addition, it is noteworthy that VILN loads on Factors 1, 2, and 3, whereas FRLG loads disproportionately on Factor 3. This reveals that the size of villein holdings was determined by contradictory factors. On the one hand, the level of manorialization shown by Factors 1 and 2 indicates a positive effect on the customary plot size. This represents the landlord's effort to maintain his villeins' holdings intact and ensure that they are sufficient to pay out the heavy burden owed to him. There was 'prejudice against excessive subdivisions of yardlands [or virgates], often held on customary tenures' (Lewis et al., 2001, p.182). On the other hand, demographic pressure reduced the size of villein lands. This reflects the well-known fact that population increase led to the fragmentation of virgates and other standard holdings. For instance, on the estates of the Abbey and Bishopric of Ely, Miller (1951, pp.143-4) stated that a villein holding was sometimes 'held by two or more partners not obviously related...even though the unity of the tenement remained formally unimpaired'. The size of villein lands in each parish varied according to which factor—manorialization or demographic pressure—exerted a stronger effect.

4. Manorialization

The combination of the three factors provides a suitable measurement to examine the various aspects of manorialization and demographic pressure. Notably, such a combination is superior in revealing the two-dimensional process of manorialization. Therefore, in this section, after showing indexes that represent the types of landlords and other characteristics of each parish in 1086 and 1279-80, I examine how the two factors of manorialization were related with the type of lordship.

4.1. Parochial characteristics

If the types of landlords who dominated a parish are indicated by the proportion of land under each type of lordship, then, KING, CHUR, and EARL indicate the percentage of the estates of the King, the churches, and various earls respectively. Table 6 shows the manorial features and landlord types per region in 1279-80. Furthermore, MRKT is the dummy for a parish with a functioning weekly market. Although many landlords obtained the charters to found markets, not all the projects were successful. Masschaele (1997) showed that the weekly markets functioned successfully at Odell in Bedfordshire; Linton, Caxton, Gamlingay, Kingston, Rampton, Swavesey, Fowlmere, Ickelton, and Whittlesford in Cambridgeshire; and St. Ives, Alconbury cum Weston, Buckworth, Great Gidding, Kimbolton, Glatton, and Yaxley in Huntingdonshire. Furthermore, there were functioning markets at Mursley and Winslow in Buckinghamshire; Banbury, Bampton, Bicester, Eynsham, Middleton Stoney, Thame,

Watlington, and Wootton in Oxfordshire; and Brailes, Brandon and Bretford, Bishops Itchington, Burton Dasset, Kenilworth, and Kineton in Warwickshire (Letters, 2003).

Next, I examine the characteristics of parishes during the time the Domesday Book was compiled. Note that out of the 447 parishes registered in the Hundred Rolls, only 435 are recorded in the Domesday Book. Thus, the unrecorded 12 parishes are eliminated from the analysis.¹⁰ The indexes showing the manorial features of each parish in the Domesday Book are calculated in the same way as those in the Hundred Rolls. First, DKING, DCHUR, and DEARL represent the percentage of the Domesday estates in each parish of the King, the Church, and the various earls respectively. Then, DMANR and DCOIN represent the self-weighted average of manorial acreage and the level of coincidence between a parish and manors in 1086 respectively. I calculate the size of arable land on the basis of the number of plough teams (*carucae*) that were recorded as being at work. When the number is not recorded, I use the amount of land for which there were teams (*terra n carucis*). Furthermore, in the few cases where both data are missing, I resort to the number of hides. How accurately these calculations represent the actual acreage of arable land is debatable; however, I could avoid these uncertainties to an extent, by calculating DMANR and DCOIN without converting the number of plough teams into acres (Darby, 1977, p.95). In addition, I calculate the proportions of several kinds of tenants: DBORD, DSLAV, and DFREM are the percentage of the number of borders, slaves, and freemen respectively. The Domesday

¹⁰ The following parishes are not recorded in the Domesday Book. Chellington (Beds.), Launton, Newton Purcell, Northmoor, Souldern (Oxon.), Allesley, Halford, Offchurch, Stivichall, Stoke and Biggin, Willenhall, and Wyken (Warw.)

Book also registered many 'villani'. However, they were 'a miscellaneous group'. While borders, slaves, and freemen can be defined by smallholding, slavery, and free status respectively, 'villani may well have included all the other peasants' (Faith, 1997, p.86). Table 7 shows the manorial features and landlord and tenant types in 1086.

4.2. Manorialization and landlord types

Next, I examine the effects of the type of landlords and other parochial characteristics on the manorial features in 1086 and 1279-80. In this investigation, the factor scores obtained in the factor analysis are introduced as dependent variables in the multiple regression analysis. Although various field scholars across research subjects have used factor scores as dependent variables (e.g. Coursey and Bozeman, 1990), this causes some methodological concerns (Rummel, 1970). Thus, I also conduct multiple regression analyses by entering each component of the manorial feature as a dependent variable. Tables 9 and 11 present the results of the multiple regression analyses using the parochial characteristics of the Hundred Rolls and the Domesday Book respectively, as independent variables.

The process of manorialization differs according to the type of landlord. Manorialization consists of two factors, namely, the development of the classical structure and the oppression of freedom. Then, each parish can be placed on a two-dimensional chart (Table 8) and is broadly classified into four groups. First, the highly manorialized parishes are characterized by high factor score for classical structure and low factor score for freedom. Many of the large ecclesiastical estates were located in these parishes.

As the multiple regression models in Table 9 report, CHUR has a significantly¹¹ positive and negative effect on Factor 1 (classical structure) and Factor 2 (freedom) respectively. Parishes with dominant ecclesiastical estates exhibited more classical structures and had fewer freeholders than those mainly consisting of knight manors. Indeed, if I tentatively suppose that the 52 parishes in Table 8, whose classical structure factor and freedom factor exceeds 0.5 and is less than -0.5 respectively, were highly manorialized, as Table 10 shows, 54.4 percent of the acreage of these parishes was covered by church estate. This percentage is significantly high since ecclesiastical estates accounted for only 30.0 percent in total acreage of all the 447 parishes. Furthermore, it is noteworthy all the church estates in the highly manorialized parishes, except the estate of the Cistercian Abbey of Thame at Sydenham (Oxon.), had already been established by the end of the eleventh century. All the landlords of the old-established ecclesiastical estates were bishops or Benedictine abbeys, namely, the Bishops of Ely at Little Gransden (Cambs.) and Somersham (Hunts.); the Bishops of Lincoln at Spaldwick (Hunts.) and Banbury (Oxon.); the Bishops of Coventry and Lichfield at Chadshunt and Gaydon (Warw.) and Bishops Itchington (Warw.); Ramsey Abbey at Broughton, Elsworth, Girton, Graveley (Cambs), Houghton cum Wyton, Old Weston, and Warboys (Hunts.); Thorney Abbey at Stanground (Hunts.); Eynsham Abbey at Eynsham and South Stoke (Oxon.);¹² Westminster Abbey at Launton¹³ (Oxon.); St.

¹¹ In this instance and hereafter, unless mentioned otherwise, the term 'significant' refers to significance at the 5 percent level.

¹² The Bishop of Lincoln held Eynsham and South Stoke in 1086, but soon afterward, they were granted to Eynsham Abbey (Crossley and Eirington, 1990, p.120; Lobel, 1962, p.96).

Albans Abbey at Winslow (Bucks.); Abingdon Abbey at Lewknor and Cuddesdon (Oxon.); Winchcombe Abbey at Enstone (Oxon.); and Coventry Priory at Wasperton with Packwood (Warw.) As Miller and Hatcher (1978, p.182) stated, 'Episcopal estates were often very extensive, including many manors in which demesne agriculture was conducted on a large scale' and 'the estates of the old Benedictine abbeys were those consisting of units corresponding most closely to the "classical" notion of the manor'. In addition, Table 11 reveals DCHUR, or the percentage of ecclesiastical estates in 1086, as having a significantly positive and negative influence on classical structure and freedom respectively. This finding also supports the fact that many of the earlier-established ecclesiastical estates developed in the classical structure and oppressed freedom.

The increase in the classical structure factor is not, however, always accompanied by a reduction in the freedom factor. A large-sized manor covering almost all the territory of a parish sometimes had a large number of free holdings. The parishes of such manors belong to the second group in the two-dimensional chart of manorialization. In these parishes, the scores for classical structure are quite high, while those for freedom are not as high. It is notable that earls' estates were comparatively prominent in the second group of manorialization. The multiple regression models in Table 9 reveal that the coefficient of EARL is significantly positive when the dependent variable is Factor 1, but it not significant when the dependent variable is Factor 2. Many parishes, including the great estates of the earls, had classical manorial structures, but they were not

¹³ The Domesday Book does not mention the Abbey's estates in Launton. However, Launton was 'given by Edward the Confessor' and 'in demesne at all times' (Harvey, 1977, p.356).

necessarily dominated by demesne and villein holdings. Indeed, if it is tentatively assumed that the 48 parishes, whose classical structure factor and freedom factor exceeds 0.5 and -0.5 respectively, were in the second group of manorialization, as Table 10 shows, then 15.1 percent of the acreage of these parishes was covered by earls' estates. This percentage is significantly high since earls' estates accounted for only 6.2 percent of the total acreage of all the 447 parishes. For example, the estates of the Earl of Cornwall in Glatton (Hunts.), Benson, and Cherstone (Oxon.), those of the Earl of Warwick in Hanslope (Bucks.) and Brailes (Warw.), and those of the Earl of Gloucester in Shipton under Wychwood (Oxon.), belonged to this group. Indeed, the earls' estates often shared classical structures with the great ecclesiastical estates; as Lewis et al. (2001, p.159) stated, 'They were the most likely among the lay manors to conform the "classic" manorial regime'. However, this analysis shows that demesne and unfree holdings were not as dominant on many of the earls' estates as they were on those of the Church.

Next, the third group in the two-dimensional chart shows a feature conflicting of manorialization, namely, low scores for classical structure and freedom. The parishes in this group were divided into small manors consisting mainly of demesne and villein holdings. The ecclesiastical and lay landlords managed the demesnes within these manors quite intensively. As Faith (1997, p. 189) stated, most religious houses founded after the Norman Conquest had to 'assemble estate piecemeal'; therefore, they were 'initially more likely to depend on rent income than on working their own land with tenant labour'. However, in the following centuries, they advanced 'the process of demesne formation'. The intensive management of demesnes was not confined to church

estates. Whether landlords were ecclesiastical or lay, 'the pressure to increase the size and profitability of demesnes on small estates was even greater than on large' (Faith, 1997, pp.197-199).

Finally, the fourth group consists of less manorialized parishes; they are divided into small manors, and free tenements were predominant. These features in the thirteenth century had been affected by the manorial structures shown in the Domesday Book.

First, many parishes consisting of small manors in 1279-80 also had small manors in 1086. As Table 11 shows, DMANR has a significantly positive effect on Factor 1. Second, parishes with more divisions in 1086 had more freeholders in 1279-80. Table 11 reveals that DCOIN has a significantly negative effect on Factor 2. The division of a parish into several manors in 1279-80 is not necessarily correlated with the increase of free tenements. Factor 2 is nearly independent of Factor 1, with COIN loading greatly on the latter. In contrast, the development of a great manor covering almost all of a parish in 1086 oppressed the increase of freeholders. As Hilton (1975, p.25) stated, 'the absence of large-scale early manorialization resulted in a high proportion of free tenants at the end of the thirteenth century'. Lastly, there were more free tenements in ancient demesnes. Table 11 shows that DKING, or the percentage of the estate of William the Conqueror or Edward the Confessor, has a significantly positive influence on Factor 2. However, not all the parishes including ancient demesnes were non-manorialized in 1279-80. Some church and lay landlords succeeded to the King's estates and established manors that had classical structures but were dominated by free tenements. Thus, these manors belong to the second group of manorialization, such as the estates of Hugh Peeche on Alconbury cum Weston (Hunts), of John de Hasting on Brampton (Hunts.), of the Earl of

Gloucester on Shipton under Wychwood (Oxon.), of the Earl of Cornwall on Benson, of the Earl of Warwick on Brailes (Warw.) and Stoneleigh Abbey on Stoneleigh (Warw.). Furthermore, Hugh de Plessy on Headington (Oxon.) and Baron Segrave on Kineton with Combrook (Warw.) had developed a large manor dominated by demesne and unfree tenements. However, the other parishes including ancient demesnes, such as Fordham, Isleham (Cambs.) and Grafham with East Perry, and Great Paxton (Hunts.), do not show evidence of formation of great manors covering almost an entire parish. In fact, these parishes were divided into small manors and were dominated by free tenements. Thus, classical structures developed on some ancient demesnes, but not on others. This is why the coefficient of DKING is insignificant when the dependent variable is Factor 1. In this manner, by using the factors of classical structure and factor, I locate diversified types of parishes on a two-dimensional chart and reveal the various features of manorialization.

5. Regional differences in manorialization and demographic pressure

Next, I analyze the regional differences in manorialization and population growth. It is often assumed that classical manors were established in the Midlands, where common fields developed and villages were nucleated. As Postan (1972, p.100) stated, 'a typical manor with its large demesne and numerous tenantry was most appropriate to the predominantly arable plants of central and southern England'. These features are considered to contrast with those of non-manorial estates in other regions, where the field system was irregular and settlements were scattered. The manorial features shown in the Hundred Rolls approximately support this distinction. There was a slight

tendency for the population to stagnate on parishes with classical manorial structures. Factor 3 is significantly correlated with Factor 1. However, as Table 4 shows, the correlation coefficient is as low as 0.306. In addition, the correlation coefficient of Factor 3 with Factor 2 is weaker (this coefficient is only -0.195). Therefore, the relationship between manorialization and demographic growth could be more complex than what is indicated in Postan's thesis.

5.1. Manorialization and non-manorialization

In the Midlands, the eastern and western parts share features of high manorialization. Parishes had classical structures and were dominated by demesne and villein holdings. As Table 9 shows, in the multiple regression models where the dependent variable is either Factor 1 or Factor 2, the coefficient of EMID (the dummy for the eastern champion Midlands) is insignificant. In contrast, the coefficients of SECP, EANG, and ARDN (the dummies for the south-eastern champion, the East Anglian Heights, and the Forest of Arden respectively) have a significantly positive effect on Factor 1 and a negative effect on Factor 2. In many parishes in these regions, the size of manors was not so great, a parish did not fairly coincide with a manor, and demesne and unfree tenements were not dominant. These non-classical manorial structures accompanied the 'irregular' field system and scattered settlements. However, this is not an unexceptional rule. The coefficient of CHIL (the dummy for the region of Chiltern) is significant for neither Factor 1 nor Factor 2. This corresponds to the following statement of Roden and Baker (1966, p.74): 'Chiltern society in the thirteenth century was strongly manorialized with free and villein tenants owing rents and services to a

lord'. Chiltern had unevenly subdivided fields and enclosed lands held in severalty; however, such an irregular field system did not necessarily prevent manorialization.

Furthermore, it is important to know that the regions of the south-eastern champion, East Anglian Heights, and the Forest of Arden were 'non-manorialized' in different ways. Locating each parish on the two-dimensional chart reveals diverse processes of manorialization. First, peasants in the Forest of Arden enjoyed a higher level of freedom than those in other non-manorialized regions. In multiple regression models with Factor 2 or FREE as the dependent variable, the coefficients of ARDN are significantly positive and, moreover, are significantly different from that of SECP. The parishes in the Forest of Arden show a significantly greater factor score of freedom than those of not only the champion Midlands, but also that of the south-western champion. Many parishes in the Forest of Arden were newly cleared only from the twelfth century onwards, whereas people had settled in the south-western champion area from a much earlier period. Then, many people moved into the virgin soil of the Forest of Arden, and as the local landlords needed many tenants to reclaim the forest, these conditions made 'for comparative freedom in the legal status of the peasant population' (Hilton, 1975, p.123).

In addition, the size of parishes was relatively small in the Forest of Arden, since many settlements were newly established in the twelfth and thirteenth centuries; 'the penetration of the Arden forest did not take place on any scale until the twelfth century' (Hilton, 1975, p.123). Therefore, though the level of coincidence between a parish and manors in the Forest of Arden was not significantly different from that in the champion

Midlands, the weighted average of manorial size was significantly smaller in the Forest of Arden. This is why, the results of the multiple regression models in Table 9 show that while SECP and EANG have a significantly negative effect on both MANR and COIN, ARDN has a significantly negative effect only on MANR.

5.2. Manorialization and demographic pressure

Differences in demographic pressure are more prominent among the landscape regions. The level of demographic pressure was often diverse among regions that were manorialized in a similar way. Using the analysis of significant differences between the coefficient dummies in the multiple regression models with Factor 3 (the factor of demographic pressure) as the dependent variable, I devise the order of population pressure among the regions. The highest pressure was in the East Anglian Heights, followed by the south-eastern champion, the eastern champion Midlands, and the western champion Midlands or Chiltern.¹⁴

First, it is noteworthy that the eastern champion Midlands had significantly higher population pressure than its western counterpart, although both regions were manorialized to a similar level. This fact accords with Hallam's (1988) statement that the population in Huntingdonshire increased faster than that in Felden Warwickshire and Oxfordshire between 1086 and the thirteenth century. Huntingdonshire and

¹⁴ The demographic pressure in the Forest of Arden was significantly higher than in western and eastern champion Midlands and Chiltern, but not significantly different from that in the East Anglian Heights and the south-eastern champion.

Cambridgeshire are listed as 'exceptionally populous'. Indeed, as the order shows, all the three regions in Huntingdonshire and Cambridgeshire, namely, the eastern champion Midlands, the south-eastern champion, and the East Anglian Heights, had significantly higher demographic pressure than the western champion Midlands. However, it is important to know that the population structure of the eastern champion Midlands also differed from that of the other two regions. The size of villein holdings in the eastern champion Midlands was significantly larger than the sizes of villein holdings in the south-eastern champion and the East Anglian Heights, although it was significantly smaller than that in the western champion Midlands. As mentioned before, the size of villein holdings fairly loads not only on Factor 3, but also on Factor 1 and Factor 2. The struggle to maintain the size of villein holdings reflects the contradiction between manorialization and population pressure. Then, many manors in the eastern champion Midlands had relatively large customary tenure under severe demographic pressure.

In contrast, in the south-eastern champion and the East Anglian Heights, small free tenements increased remarkably, while cotlands did not increase as much. In multiple regression models with FRSM as the dependent variable, the coefficient of EANG is significantly greater than that of SECP, and the latter is significantly greater than that of EMID. In contrast, when COTL is the dependent variable, the coefficients of EANG, SECP, and EMID are not significantly different each other. Indeed, the effect of the natural environment was obvious. In the East Anglian Heights, almost all the parishes with more than 100 free tenements, such as Horningsea, Teversham, Fulbourn, Great Wilbraham, Little Wilbraham, Bottisham, and Burwell, were located at the edge of

‘Swaffham and Burnwell Fens’ (Taylor, 1973, p.210). Small tenements may have proliferated as the result of squatting at Edge of the Fens. Furthermore, the parishes in these two regions had been greatly divided into several estates at the time the Domesday Book was being compiled. Table 7 shows that DCOIN of the two regions was significantly smaller than the corresponding values for the eastern and western champion Midlands. For example, in Teversham (Cambs.), divided by the estates of the King, Ely Abbey, Count Alan, John FitzWaleran, and Geoffrey de Mandeville, there were 394 free tenements in 1086, but only 34 cotlands in 1279-80. In general, parishes subdivided by small manors in 1086 tended to have a large population in 1279-80; notably, the number of small free tenements increased. As mentioned before, DCOIN has a significantly negative effect on Factor 3. Furthermore, DCOIN also has a significantly negative effect on FRSM, but is insignificant for COTL.

Finally, small tenements multiplied in parishes with weekly markets. It is not surprising that MRKT has a significantly positive influence on BURG. However, it is noteworthy that MRKT also significantly increases FRSM. For example, in Yaxley (Hunts.), Thoney Abbey established a weekly market and had as many as 99 free tenements. Some of the tenants had occupational surnames, such as *carnifex* (butcher), *cirotecarius* (glover), *faber* (smith), *mercator* (merchant), and *piscator* (fisher). Many non-agricultural occupants stayed around a market irrespective of whether the landlord settled burgages.

6. Conclusion

This paper examined the diverse processes of manorialization and population growth according to landlord types and landscape regions in thirteenth century England. Factor analysis (maximum likelihood estimation and promax rotation) of the data from the Hundred Rolls identified three factors: classical structure, freedom, and demographic pressure. This methodology is superior in that it conclusively proves that manorialization was a two-dimensional process. First, in highly manorialized parishes, a large manor coincided with a parish, and second, demesne and villein tenements were dominant. Highly manorialized parishes were mainly occupied by the earlier-established ecclesiastical estates. However, the two aspects did not always appear concurrently. While earls' estates were relatively prominent in parishes with a classical structure, they were also dominated by free tenements. Furthermore, the three chosen factors, namely, classical structure, freedom, and demographic pressure, revealed the differences among the six landscape regions. In the western and eastern champion regions of the Midlands and Chiltern, many parishes were highly manorialized. In contrast, in the other regions, the parishes were non-manorialized in different ways. Notably, in the Forest of Arden, the factor scores for freedom were found to exceed those for south-eastern champion. The factor of demographic pressure revealed other regional differences. While parishes in the western and eastern parts of champion Midlands were manorialized in a similar way, the eastern part faced greater population pressures. However, this pressure in the eastern champion Midlands was still less than that in the south-eastern champion and the East Anglian Heights. In the eastern champion Midlands, the landlords could manage to maintain the size of the

villein holdings. In contrast, in the other two regions, where many parishes had been divided from the eleventh century onwards, villein plots were fragmented, and small free tenements proliferated.

Thus, factor analysis concerning classical structure, freedom, and demographic pressure revealed regional differences in manorialization and population growth in medieval England. Future research could focus on the effect of the three factors on rent.

It would be worthwhile to investigate how classical structure, freedom, and demographic pressure relate to the rents owed by peasants to their landlords.

References

- Coursey, D. and Bozeman, B., 1990. Decision Making in Public and Organization: A Test of Alternative Concept of "Publicness." *Public Administration Review*, 50, 5, 525-535.
- Crossley, A., 1972. *Victoria County History: Oxfordshire*, vol. 10.
- Crossley, A. and Eirington, C. R., 1990. *Victoria County History: Oxfordshire*, vol. 12.
- Darby, H. C., 1977. *Domesday England*. Cambridge University Press, Cambridge.
- Faith, R., 1997. *The English Peasantry and the Growth of Lordship*. Leicester University Press, Leicester.
- Hallam, H. E., 1988. Population movements in England, 1086-1350. In Hallam, ed., *The Agrarian History of England and Wales, Vol. II*. Cambridge University Press, Cambridge.
- Harvey, B., 1977. *Westminster Abbey and its Estates in the Middle Ages*. Clarendon Press, Oxford.
- Herfindahl, O. C., 1950. *Concentration in the U.S. Steel Industry*. Doctorial dissertation, Columbia University, New York.
- Hilton, R. H., 1975. *The English Peasantry in the Later Middle Ages*. Clarendon Press, Oxford.
- Hilton, R. H., 1983. *The Decline of Serfdom in Medieval England*, 2nd ed. Macmillan Press, London.
- Hirschman, A. O., 1945. *National Power and the Structure of Foreign Trade*. University of California Press, Berkley.
- Illingworth, W. and Caley, J., eds., 1818. *Rotuli Hundredorum: Temp. Hen. III & Edw. I*

- in Turr' Lond' Et In Curia Receptæ Scaccarij Westm. Asservati, Vol. 2. Record Commission, London.
- Kanzaka, J., 2002. Villein Rents in Thirteenth-century England: An Analysis of the Hundred Rolls of 1279-1280. *Economic History Review*, 55, 593-618.
- Kosminsky, E.A., 1956. *Studies in the Agrarian History of England in the 13th Century*. Oxford University Press, Oxford.
- John, T., 1992. *The Warwickshire Hundred Rolls of 1279-80, Stoneleigh and Kineton Hundreds*. Oxford University Press, Oxford.
- Jones, R. and Page, M., 2006. *Medieval Villages in an English Landscape: Beginning and Ends*. Windgather Press, Cheshire.
- Lann, A. and Falk, R., 2005. A Closer Look at a Relatively Neglected Mean. *Teaching Statistics*, 76, 3, , 76-80.
- Letters. S., 2003. *Gazetteer of Markets and Fairs in England and Wales to 1516*. List and Index Society Publications Special Series, Vols. 32 and 33.
- Lewis C., Mitchell-Fox, P. and Dyer, C., 2001. *Village, Hamlet and Field: Changing Medieval Settlements in Central England*. Windgather Press, Cheshire.
- Lobel, M. ed., 1962. *Victoria County History: Oxfordshire*, vol. 7.
- Maitland, F.W., 1897. *Domesday Book and Beyond: Three Essays in the Early History of England*. Cambridge University Press, Cambridge.
- Masschaele, J., 1997. *Peasants, Merchants, and Markets: Inland Trade in Medieval England, c.1150-c.1350*. St. Martin's Press, New York.
- Miller, E., 1951. *The Abbey and Bishopric of Ely: The Social History of an Ecclesiastical Estate from the Tenth Century to the Early Fourteenth Century*. Cambridge University Press, Cambridge.

- Miller, E. and Hatcher, J., 1978. *Medieval England: Rural Society and Economic Change 1086-1348*. Longman, London.
- Milles, D.R., 1980. *Lord and Peasant in Nineteenth Century Britain*. Rowman and Littlefield, New Jersey.
- Postan, M.M., 1972. *The Medieval Economy and Society*. Weidenfeld and Nicolson, London.
- Robert, B. and Wrathmell, S., 2002. *Region and Place: A Study of English Rural Settlement*. English Heritage, London.
- Roden, D. and Baker, A.R.H., 1966. Field Systems of the Chiltern Hills and of Parts of Kent from the Late Thirteenth to the Early Seventeenth Century. *Transactions of the Institute of British Geographers*, 38, 73-88.
- Rummel, R.J., 1970. *Applied Factor Analysis*, Northwestern University Press, IllinoisLocation.
- Schumer, B., 1984. *The Evolution of Wychwood to 1400: Pioneers, Frontiers and Forest*. Leicester University Press, Leicester.
- Taylor, C., 1973. *The Cambridgeshire Landscape*. Hodder & Stoughton, London.
- Williams, A. and Martin, G.H., 2002. *Domesday Book*. Penguin Books, London.
- Williamson, T., 2003. *Shaping Medieval Landscapes: Settlement, Society, Environment*. Windgather Press, Oxford.

Table 1 Number and acreage of each tenement type in 1279-80

	western champion Midlands		eastern champion Midlands		south eastern champion		East Anglian Height		Chiltern		Forest of Arden		total	
no. of tenements														
villein	6,638		1,903		2,119		1,126		429		179		12,394	
cotland	1,934		1,201		1,129		1,035		113		189		5,601	
large free	3,415		752		1,849		970		356		305		7,647	
small free	1,655		1,130		2,896		2,442		104		529		8,756	
acreage														
demesne	119,387	30.0%	23,457	29.9%	37,248	36.2%	19,524	33.3%	13,149	35.0%	4,871	34.9%	217,636	31.6%
villein	158,614	39.9%	34,614	44.1%	28,008	27.2%	15,170	25.9%	10,010	26.7%	2,624	18.8%	249,039	36.1%
cotland	982	0.2%	742	0.9%	964	0.9%	768	1.3%	116	0.3%	29	0.2%	3,602	0.5%
large free	116,820	29.4%	18,474	23.5%	33,286	32.4%	20,509	35.0%	14,183	37.8%	5,967	42.8%	209,238	30.4%
small free	1,837	0.5%	1,169	1.5%	3,345	3.3%	2,590	4.4%	91	0.2%	447	3.2%	9,479	1.4%

Sources: Illingworth and Caley (1818) and John (1992)

Table 2 Correlation between the variables of manorial features

	MANR	COIN	FREE	VILN	COTL	FRLG	FRSM	BURG
MANR	1.000	.460	-.136	.348	.137	.246	.030	.288
COIN		1.000	-.245	.170	-.103	.137	-.263	.002
FREE			1.000	-.311	-.119	.204	.292	-.019
VILN				1.000	-.100	.381	-.275	.056
COTL					1.000	-.124	.266	.022
FRLG						1.000	-.216	.009
FRSM							1.000	.002
BURG								1.000

Sources: Illingworth and Caley (1818) and John (1992)

Table 3 Factor loading after promax rotation

	Factor 1	Factor 2	Factor 3
	classical structure	freedom	demographic pressure
MANR	1.029	.028	-.094
COIN	.405	-.178	.138
FREE	-.023	1.015	.179
VILN	.219	-.269	.417
COTL	.217	-.097	-.435
FRLG	.151	.248	.615
FRSM	.191	.313	-.527
BURG	.314	.030	-.095
eigenvalue	1.580	1.382	1.201
contribution (%)	20.58	13.87	13.13

Sources: Illingworth and Caley (1818) and John (1992)

Table 4 Correlation between factors

	Factor 1	Factor 2	Factor 3
Factor 1	1.000	-.190	.306
Factor 2		1.000	-.195
Factor 3			1.000

Sources: Illingworth and Caley (1818) and John (1992)

Table 5 Factor scores per region

N	western champion Midlands 243		eastern champion Midlands 55		south eastern champion 78		East Anglian Height 39		Chiltern 17		Forest of Arden 15		
	average	std	average	std	average	std	average	std	average	std	average	std	
1	classical structure	0.169	1.016	0.340	1.290	-0.496	0.573	-0.455	0.560	0.222	0.572	-0.465	0.955
2	freedom	-0.141	0.981	-0.326	0.866	0.293	0.906	0.466	0.915	-0.056	0.790	0.813	1.224
3	population	0.405	0.642	-0.252	0.574	-0.625	0.565	-0.905	0.694	0.528	0.555	-0.627	0.629

Sources: Illingworth and Caley (1818) and John (1992)

Table 6 Manorial features and landlord types in 1279-80

	western champion Midlands		eastern champion Midlands		south eastern champion		East Anglian Height		Chiltern		Forest of Arden	
N	243		55		78		39		17		15	
	average	std	average	std	average	std	average	std	average	std	average	std
manorial features												
MANR	0.889	0.629	1.031	0.809	0.536	0.353	0.581	0.352	0.917	0.346	0.565	0.612
COIN	0.643	0.309	0.717	0.312	0.460	0.278	0.426	0.251	0.556	0.307	0.588	0.278
FREE	0.296	0.206	0.233	0.180	0.351	0.185	0.377	0.185	0.318	0.164	0.459	0.255
VILN	22.84	8.45	17.07	6.67	12.85	4.30	12.81	3.34	23.19	5.70	9.58	6.25
COTL	8.57	13.24	21.84	21.48	14.47	18.82	26.54	25.28	6.65	7.29	12.60	15.29
FRLG	36.39	22.34	24.39	15.33	18.78	7.49	21.81	10.57	41.86	25.15	17.94	5.52
FRSM	6.84	14.05	30.24	23.22	37.13	43.68	62.62	70.01	6.12	9.20	35.27	49.20
landlords												
KING	0.015	0.108	0.000	0.000	0.000	0.000	0.010	0.060	0.000	0.000	0.006	0.024
CHUR	0.281	0.363	0.498	0.430	0.206	0.307	0.273	0.314	0.159	0.276	0.415	0.389
EARL	0.054	0.193	0.047	0.192	0.009	0.049	0.084	0.216	0.029	0.083	0.009	0.034

Sources: Illingworth and Caley (1818) and John (1992)

Table 7 Manorial features and landlord and tenant types in 1086

	western champion Midlands		eastern champion Midlands		south eastern champion		East Anglian Height		Chiltern		Forest of Arden	
N	237		55		77		39		17		10	
	average	std	average	std	average	std	average	std	average	std	average	std
landlords												
DKING	0.032	0.165	0.079	0.246	0.046	0.177	0.100	0.220	0.000	0.000	0.097	0.292
DCHUR	0.112	0.289	0.458	0.475	0.165	0.321	0.170	0.284	0.011	0.043	0.071	0.214
DEARL	0.137	0.304	0.135	0.321	0.207	0.297	0.270	0.325	0.153	0.320	0.203	0.399
manorial feature												
DMANR	0.010	0.013	0.010	0.011	0.007	0.010	0.009	0.010	0.011	0.013	0.008	0.012
DCOIN	0.795	0.256	0.828	0.214	0.586	0.283	0.593	0.262	0.724	0.277	0.821	0.210
tenants												
DBORD	0.290	0.186	0.098	0.094	0.406	0.236	0.307	0.142	0.216	0.153	0.390	0.215
DSLAV	0.209	0.088	0.231	0.090	0.160	0.093	0.204	0.077	0.238	0.069	0.162	0.068
DFREM	0.009	0.031	0.037	0.055	0.059	0.117	0.032	0.074	0.017	0.041	0.006	0.013

Sources: Illingworth and Caley (1818), John (1992), and Williams and Martin (2002)

Table 8 Two-dimensional manorialization chart

		Factor 1						
		-1.5	-1.0	-0.5	0.0	0.5	1.0	1.5
Factor 2	-2.0	0	1	2	2	1	0	0
	-1.5	1	13	11	15	10	4	3
	-1.0	2	24	16	20	11	9	14
	-0.5	3	25	23	16	9	2	5
	0.0	7	19	27	14	5	4	7
	0.5	6	15	9	6	6	2	1
	1.0	6	21	6	3	2	0	1
	1.5	4	15	10	5	1	0	3

Sources: Illingworth and Caley (1818) and John (1992)

Table 9 Multiple regression analyses of landlord types and landscape regions in the Hundred Rolls

Dependent variable	Factor 1	Factor 2	Factor 3	MANR	COIN	FREE	VILN	COTL	FRLG	FRSM	BURG
Independent variable											
KING	0.070 (0.138)	-0.879 (-1.617)	-0.769 (-2.118) *	0.073 (0.231)	0.179 (1.045)	-0.211 (-1.871)	-3.465 (-0.828)	27.136 (2.827) **	-19.105 (-1.762)	-1.804 (-0.094)	19.473 (1.751)
CHUR	0.588 (5.009) **	-0.604 (-4.819) **	-0.082 (-0.981)	0.365 (5.018) **	0.186 (4.705) **	-0.131 (-5.045) **	0.877 (0.909)	8.499 (3.842) **	-2.244 (-0.898)	0.418 (0.095)	3.999 (1.560)
EARL	0.933 (3.793) **	0.033 (0.127)	0.191 (1.089)	0.578 (3.793) **	0.131 (1.585)	0.009 (0.174)	2.239 (1.108)	6.955 (1.500)	8.813 (1.682)	6.884 (0.745)	-3.621 (-0.674)
MRKT	1.021 (6.434) **	-0.235 (-1.385)	-0.154 (-1.364)	0.649 (6.597) **	0.030 (0.565)	-0.059 (-1.686)	1.723 (1.321)	1.646 (0.550)	-1.184 (-0.350)	17.538 (2.942) **	28.558 (8.238) **
EMID	-0.020 (-0.149)	-0.049 (-0.345)	-0.637 (-6.692) **	0.023 (0.282)	0.035 (0.777)	-0.033 (-1.133)	-6.121 (-5.578) **	11.753 (4.668) **	-11.634 (-4.089) **	12.415 (2.475) *	-4.624 (-1.585)
SECP	-0.597 (-5.185) **	0.382 (3.107) **	-1.035 (-12.599) **	-0.310 (-4.348) **	-0.162 (-4.178) **	0.044 (1.730)	-9.914 (-10.474) **	7.221 (3.325) **	-17.627 (-7.183) **	30.262 (6.994) **	-3.075 (-1.222)
EANG	-0.693 (-4.586) **	0.608 (3.768) **	-1.313 (-12.177) **	-0.351 (-3.749) **	-0.220 (-4.329) **	0.081 (2.427) *	-10.189 (-8.203) **	17.881 (6.275) **	-14.892 (-4.625) **	54.771 (9.647) **	-3.033 (-0.919)
CHIL	0.148 (0.671)	0.000 (0.001)	0.108 (0.685)	0.087 (0.639)	-0.058 (-0.788)	0.003 (0.066)	0.454 (0.251)	-0.319 (-0.077)	5.148 (1.098)	-0.547 (-0.066)	-2.597 (-0.540)
ARDN	-0.747 (-3.197) **	1.048 (4.199) **	-1.007 (-6.037) **	-0.395 (-2.727) **	-0.075 (-0.951)	0.184 (3.557) **	-13.444 (-7.000) **	3.300 (0.749)	-17.815 (-3.578) **	27.335 (3.113) **	-4.743 (-0.929)
constant	-0.107 (-1.565)	0.053 (0.722)	0.437 (8.982) **	0.717 (16.934) **	0.580 (25.267) **	0.339 (22.446) **	22.428 (39.985) **	5.315 (4.131) **	36.884 (25.363) **	5.369 (2.094) *	0.384 (0.257)
adjusted R-squared	0.232	0.118	0.400	0.217	0.120	0.100	0.295	0.147	0.153	0.230	0.131
number of parishes	447	447	447	447	447	447	447	447	447	447	447

* and ** indicate statistical significance at the 5%, and 1% level respectively.

Sources: Illingworth and Caley (1818) and John (1992)

Table 10 Manorialization and lordship

	total	highly manorialized	classically structured and not unfree
the Church	30.02%	54.41%	23.48%
earl	6.19%	6.45%	15.11%
the King	0.88%	1.08%	1.27%

Sources: Illingworth and Caley (1818) and John (1992)

Table 11 Multiple regression analyses of landlord types and manorial features in the Domesday Book

Independent variable	Factor 1	Factor 2	Factor 3	MANR	COIN	FREE	VILN	COTL	FRLG	FRSM	BURG
DMANR	45.77 (4.065) **	3.04 (0.250)	0.74 (0.073)	28.90 (4.176) **	-3.20 (-0.903)	0.44 (0.172)	140.13 (1.288)	0.14 (0.586)	0.12 (0.434)	0.58 (1.348)	0.26 (0.941)
DCOIN	0.373 (1.923)	-0.908 (-4.327) **	0.471 (2.700) **	0.192 (1.610)	0.566 (9.282) **	-0.172 (-3.941) **	3.667 (1.957)	0.068 (0.017)	3.530 (0.756)	-18.752 (-2.513) *	-2.922 (-0.612)
DKING	0.394 (1.653)	0.879 (3.409) **	-0.707 (-3.295) **	0.305 (2.079) *	-0.017 (-0.225)	0.154 (2.868) **	-6.266 (-2.720) **	20.782 (4.196) **	-0.572 (-0.100)	42.577 (4.642) **	-3.870 (-0.659)
DCHUR	0.308 (2.878) **	-0.351 (-3.035) **	-0.024 (-0.251)	0.190 (2.881) **	0.102 (3.044) **	-0.075 (-3.110) **	1.888 (1.825)	4.281 (1.925)	-2.354 (-0.913)	0.869 (0.211)	4.272 (1.621)
DEARL	-0.134 (-0.997)	-0.001 (-0.010)	-0.171 (-1.411)	-0.075 (-0.905)	-0.039 (-0.933)	-0.006 (-0.194)	0.352 (0.271)	4.507 (1.612)	-4.798 (-1.480)	3.729 (0.720)	0.420 (0.127)
DBORD	-0.014 (-2.841) **	0.006 (1.057)	-0.017 (-3.730) **	-0.008 (-2.569) *	-0.004 (-2.628) **	0.001 (0.563)	-0.126 (-2.645) **	0.114 (1.115)	-0.246 (-2.070) *	0.604 (3.184) **	0.015 (0.122)
DSLAV	0.024 (2.329) *	-0.015 (-1.378)	0.021 (2.311) *	0.013 (2.154) *	0.001 (0.234)	-0.002 (-1.079)	0.234 (2.381) *	0.129 (0.608)	0.395 (1.610)	-0.901 (-2.301) *	0.294 (1.175)
DFREM	-0.005 (-0.308)	0.057 (3.116) **	-0.066 (-4.369) **	0.002 (0.145)	-0.001 (-0.104)	0.009 (2.460) *	-0.185 (-1.135)	-0.136 (-0.387)	-0.581 (-1.431)	6.357 (9.800) **	-0.306 (-0.737)
constant	-0.824 (-5.160) **	0.706 (4.088) **	-0.236 (-1.638)	0.314 (3.201) **	0.214 (4.265) **	0.453 (12.563) **	14.434 (9.351) **	6.783 (2.044) *	27.883 (7.246) **	21.206 (3.450) **	-1.344 (-0.342)
adjusted R-squared	0.304	0.151	0.150	0.303	0.300	0.118	0.116	0.075	0.028	0.285	0.027
number of parishes	435	435	435	435	435	435	435	435	435	435	435

* and ** indicate statistical significance at the 5%, and 1% level respectively.

Sources: Illingworth and Caley (1818), John (1992), and Williams and Martin (2002)