

Full Length Research Paper

Investigating tax fairness in eleventh century England: Evidence from Wiltshire estates

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Accepted 10 September, 2011

The Domesday Survey of 1086 recorded a wealth of information on the Anglo-Norman tax system. The survey data includes the tax assessments, incomes and resources of most estates in England. The assessments relate to an estate tax known as the geld. Details of the way the assessments were imposed and the rationale underlying the assessment process are no longer extant, but by analysing the relationships between assessments and estate characteristics, it is possible to discover the impact of the tax on landholders and infer the main features of tax policy. An earlier paper by McDonald (2002), describes research into how Domesday taxes were levied and the characteristics of estates and tenants that received favourable tax treatment in Essex. In this paper, the research is extended to a second Domesday county, Wiltshire.

Key words: Tax fairness, Domesday book, the geld, tax frontier.

INTRODUCTION

The Domesday survey of 1086 generated a wealth of information on the Anglo-Norman tax system. Commissioned some 20 years after William, Duke of Normandy, conquered England the survey record, Domesday book, contains data on the tax assessments, incomes and resources of most estates in England. The assessments are those for an estate tax known as the geld. Details of the way the assessments were imposed and the rationale underlying the assessment process are no longer available to us, but by analysing the relationships between assessments and estate characteristics, it is possible to discover the impact of the tax on landholders and infer the main features of tax policy. An earlier paper, McDonald (2002), describes research into how Domesday taxes were levied and the characteristics of estates and tenants that received favourable tax treatment in Essex. In this paper, the research is extended to a second Domesday county, the County of Wiltshire. The evidence seems to suggest that in many respects, the tax system possessed characteristics similar to those of modern tax systems. It seems to have been constructed on a capacity to pay principle but with

some unevenness in the application of the principle as a consequence of administrative practice and political considerations. This view is at odds with the ideas of Victorian historians who saw the assessments as an 'artificial' administrative creation bearing little relationship to estate income.

BACKGROUND AND RELATED RESEARCH

The Domesday survey

The Domesday survey was announced by King William at the Christmas meeting of the Great Council at Gloucester in 1085. In the following year, commissioners sent out a survey questionnaire to landholders. Their answers were reviewed in local courts and became public knowledge. The survey information was then summarized and edited at Winchester by the Exchequer to form Domesday Book. Data in Domesday book are organized by county. Within a county, the king's estates are listed first, followed by the estates of ecclesiastical

tenants-in-chief and then lay tenants-in-chief. Domesday book consists of two volumes, Great and Little Domesday. Little Domesday is the survey return for the counties of Essex, Norfolk and Suffolk and Great Domesday is a summary of the returns for the other counties of England. The survey was used to document the contemporary feudal structure and revise tax assessments. Godfrey and Hooper (1996: 51) argued that, "By providing a valuation and audit of the resources of the feudal tenants-in-chief in 1086, Domesday enabled William and his successors to optimize both their wealth, through fiscal policy and efficient use of the country's resources, and their power within the feudal structure of medieval England. For the English monarchy of the period, Domesday served both accountability and decision-making needs"¹.

Earlier research on the tax assessments

The geld assessments listed in Domesday book relate to a non-feudal tax first levied by King Ethelred in 911 to fund a force to counter Danish incursions. Oldroyd (1997) describes the geld and public accounting in the Anglo-Saxon period. A land tax originally, it is thought that by Norman times it was more broadly based. It was a significant burden on landholders, being levied annually by 1086 and amounting to about 15% of the net income of the average Wiltshire lay estate. Round (1895) and the Victorian Domesday scholars saw the Domesday tax assessments as an 'artificial' administrative construct not linked to individual estate income. This view was largely based on Round's unsystematic and subjective review of the distribution of the assessments across estates, and the local government units, the vills and the hundreds of counties.

He argued that the assessments were imposed on the hundreds of the county in 100-hide units and vills in five-hide units and then apportioned to estates. As a consequence the assessments bore little relationship to

the ability of the estate to pay the tax.

In McDonald and Snooks (1985a, 1986), Snooks and I argued a contrary view. Using regression methods, we showed, for example, that for Wiltshire lay estates between 74 and 80% of variation in the tax assessments could be attributed to variations in manorial net incomes (referred to in Domesday as annual values) or manorial resources, two alternative ways of measuring capacity to pay. Similar results were obtained for other counties. Capacity to pay explains from 56 to 89% of variation in individual estate assessment data for the counties of Buckinghamshire, Cambridgeshire, Essex and Wiltshire, and from 72 to 81% for aggregate data for 29 counties (McDonald and Snooks, 1987a). Influenced by this empirical evidence, we argued that similar to many modern tax systems, it was possible that the Domesday assessments reflected an attempt to collect taxes in a politically acceptable way.

We postulated that the assessments may have been based on a capacity to pay principle modified by politically expedient concessions and could be expected to exhibit some unevenness resulting from the administrative process. This unevenness occurred because the assessments were revised infrequently and, consequently, the link between assessment and capacity to pay became somewhat eroded. Also, it is thought assessments were revised at different times in the various counties and the hundreds of a county, and with slightly more rigour in some administrative units than others.

METHODOLOGY

Capacity to pay explains much, but not all variation in the tax assessments across estates. Were some tenants-in-chief and some kinds of estate more favourably treated than others? These questions were investigated in McDonald (2002) using data relating to the lay lords of Essex. A nonparametric measure of favourable or beneficial taxation was calculated for each estate based on the idea that an estate has received a beneficial taxation assessment if it has a lower tax assessment than another estate with the same or lower net income or annual value. More formally, the beneficial taxation index (BTI) for estate i , was defined as the ratio of the maximum tax assessment of all estates with the same or a lower net income than estate i , to the actual tax assessment of estate i . A BTI value of one corresponds to no beneficial taxation, and a value greater than one to some beneficial taxation². In this paper, a similar analysis is carried

¹Background information on Domesday England is contained in McDonald and Snooks (1986, Ch. 1 and 2; 1985a, 1985b, 1987a, 1987b and 2003) and McDonald (1998). For more comprehensive accounts of the history of the period see Brown (1984), Clanchy (1983), Loyn (1962), (1965), (1983), and Stenton (1951). Other useful references include Ballard (1906), Darby (1952), (1977), Galbraith (1961), Hollister (1965), Lennard (1959), Maitland (1897), Miller and Hatcher (1978), Postan (1966), (1972), Round (1895), (1903), the articles in Williams (1987) and references cited in McDonald and Snooks (1986). The Survey is discussed in McDonald and Snooks (1986, sec. 2.2), the references cited there, and the articles in Williams (1987). The Domesday and modern surveys are compared in McDonald and Snooks (1985c). For other studies of the Domesday economy see McDonald (1997, 2000, 2005, 2009b and 2010). Others who have made important contributions to our understanding of the Domesday economy include Miller and Hatcher (1978), Hallam (1981) and the contributors to the volume edited by Britnell and Campbell (1995).

² The estate BTI values correspond to efficiency measures calculated in Data Envelopment Analysis (DEA). DEA has usually been used to examine the efficiency of production units. In this study it is applied to assess how favourable estate tax assessments were given the estate net income. A major advantage of using this DEA method to calculate BTI values is that it does not assume that the tax assessment-income relationship takes a particular functional form such as the linear or log-linear forms. These ideas are discussed further in McDonald (1998).

Table 1. Mean BTI of estates of 10 largest tenants-in-chief. Wiltshire Lay estates, 1086.

Tenants-in-chief	Mean BTI	Standard deviation of mean	Deviation from overall mean	Number of estates in sample
Edward of Salisbury	2.77	1.83	0.43	39
Humfrey de Insula	1.70	0.46	-0.64	27
Ernulf of Hesdin	2.69	1.25	0.35	18
Alvred of Marlborough	1.74	0.56	-0.60	20
William of Eu	2.68	1.42	0.34	14
Waleran the huntsman	2.08	0.60	-0.26	12
Miles Crispin	1.60	0.50	-0.73	11
Osbern Gifard	2.11	0.79	-0.23	11
Ralf de Mortemer	2.27	1.08	-0.07	10
Robert fitz Girold	3.80	4.49	1.46	10
Others	2.34	1.56	0.01	161

out for the lay lords of Wiltshire and the results are compared with those of the Essex study.

RESULTS

Beneficial taxation in Wiltshire in 1086

BTIs were calculated for 333 estates of the lay lords of Wiltshire in 1086 and the way in which the BTI varied by tenant-in-chief and hundred investigated.³ Table 1 lists the mean BTI of estates of the 10 largest tenants-in-chief. Robert fitz Girold appears to have been the most favourably treated tenant-in-chief. The mean BTI value for his 10 estates is 3.80. The deviation of this value from the overall mean (2.34) is 1.46. Notice, however, that the standard deviation of Robert's mean BTI is large (4.49). The high mean value is mainly due to the high BTIs of two of Robert's estates: Biddesden (BTI = 16.00) and Wilsford (BTI = 6.00). Edward of Salisbury (mean

BTI = 2.77) and William of Eu (mean BTI = 2.68) also have high mean BTIs.

Some who received less favourable treatment were Miles Crispin (mean BTI = 1.60), Humfrey de Insula (mean BTI=1.70) and Alvred of Marlborough (mean BTI = 1.74).

There appear to have been clear differences in the tax treatment of tenants-in-chief, and this is confirmed by formal statistical testing. A robust statistical test of the null hypothesis that the mean BTIs for the tenants-in-chief are equal, resulted in rejection of the null at the five and one percent significance level.⁴ The test suggests that the tenant-in-chief was a significant factor influencing how estates were taxed.

There were 37 hundred (local government) divisions in Wiltshire. A statistical test indicated that the BHI varied significantly (at the five and one percent levels) with hundred location.⁵ Hundreds for which estates received milder assessments included Ramsbury (mean BHI = 4.80), Westbury (mean BHI = 4.44), Amesbury (mean BHI = 4.14) and Elstab (mean BHI = 3.50). Some less well treated were Blackgrove (mean BHI = 1.15) and Thornhill (mean BHI = 1.20).

³ The data file was compiled by Beverley Vickers and Eva Aker, the work being funded by Australian Research Council and Flinders University research grants. The file was compiled from Domesday Book entries in the *Victoria County History, 1900* of Wiltshire, which were checked against a facsimile of the Latin transcript and English translations in the so-called Phillimore edition (Morris, 1975) and Alecto Historical Editions (Williams and Martin, 2003). Phillimore was used to determine the hundred locations of the estates. A general rule of thumb was developed that only entries for which (1) an annual value and a tax assessment are recorded, (2) either plough teams or some meadowland, pasture or woodland are recorded, and (3) some labour is recorded, were retained for analysis. In addition, 15 other entries were deleted either because they were implausible or incomplete. Some summary measures of the BTI distribution are: 20 or six percent of estates had a BTI=1, the first quartile of the distribution was 1.5, the median, 2.0, and the third quartile, 2.6. The estate of Biddesden had the largest index value of 16.

⁴ The test was carried out by regressing the BTI on tenant-in-chief binary variables taking the value 1, if the tenant-in-chief held the estate; 0, otherwise. Regression diagnostics indicated heteroskedasticity in the disturbances and White's (1980) heteroskedasticity-consistent test was used. On the null, the test statistic is asymptotically distributed as a F-distribution with 10 and 322 degrees of freedom. The test statistic value was 4.974, which has a p-value, to four decimal places, of zero.

⁵ The test was carried out in a similar way to the test for equality of the tenant-in-chief BTI means. As the hundred location of nine estates is unknown, their observations were deleted from the sample, reducing the number of observations to 324. The p-value for the test was, to four decimal places, zero.

The foregoing results suggest that all estates were not treated equally, but that tax treatment varied significantly across tenants-in-chief and the hundreds. It would be interesting to discover if the tenant-in-chief effect remains significant when we control for the hundred effect and the hundred effect is still significant when we allow for the tenant-in-chief effect. We could also ask whether the tenant-in-chief and hundred effects remain statistically significant when we control for other factors that might plausibly be expected to affect the assessments. Multiple regression was used to investigate these issues. Information is available for most estates on the size of the estate, the kind of agriculture practised and the tenure arrangement on the estate, all factors that could affect an estate's tax assessment.

Table 2 exhibits the main results of a regression of the BTI on variables measuring these characteristics.⁶ Details of the implementation of the geld are now largely unknown, so the regression will provide empirical evidence as to whether particular groups or activities received special treatment, and, given these special considerations, whether the assessments were evenly distributed over the county.

In the regression, the estate's tenant-in-chief was indicated by 10 binary variables (the i th, $i = 1 \dots 10$, taking the value 1, if the i th largest tenant-in-chief held the estate; 0, otherwise; the intercept measuring the effect when none of the 10 largest tenants-in-chief held the estate), and the hundred location by 36 binary variables (with the intercept measuring the location effect of one hundred).

Size was measured by the single best indicator of the economic size of an estate, the estate's annual value. An index of whether production was mainly arable or grazing is given by the arable/livestock ratio, defined as the number of ploughteams on the estate divided by the total acreage of woodland, pasture and meadowland. Finally, tenure was measured by a binary variable taking the value 1, if the estate was held in demesne; 0, otherwise.

The results show that both the tenant-in-chief and hundred effects remain significant when other factors are allowed to vary in the multiple regression. Tenancy, whether an estate was held in demesne (and worked by the tenant-in-chief) or run by a tenant, was a significant factor at the five (and three) but not one percent level. Estates held in demesne were, on average, more

favourably treated, having a BTI 0.61 greater than those that were sub or mesne-tenancies. Economic size (measured by the annual value of the estate) and the variable measuring the mix of arable and grazing agriculture on an estate were not significant correlates.

DISCUSSION

Comparing taxation in Wiltshire with Essex

The results of the Wiltshire tax analysis can be compared with those of the earlier analysis of taxation in Essex (McDonald, 2002). The Wiltshire data are recorded in Great Domesday and are less detailed than the Essex entries that are listed in Little Domesday. In particular, livestock information is available for Essex but not Wiltshire.⁷ There are other county differences. Arable farming was generally more important in eastern England (where Essex is located) than south-west England (where Wiltshire is situated), although in Essex large numbers of sheep were grazed on the extensive marshlands and their wool exported to the Continent. Also, the estate size distribution varied as between the counties. Compared with Wiltshire, Essex contained a few very large lay estates and many quite small holdings. There was much less variation in the size of Wiltshire estates.

For Wiltshire, the relationship between tax assessments and net income (annual value) is stronger (the coefficient of determination allowing for degrees of freedom is 0.75 for Wiltshire lay estates and 0.56 for Essex when the relationship is estimated in log-linear form) and for most estates the average tax rate is higher. Largely as a consequence of the stronger capacity to pay relationship for Wiltshire, BTI values tend to be lower.⁸

In the regressions of BTI on factors associated with taxation, there are some similarities between the county results and some differences (Table 2). For both, there appears to have been differential treatment of tenants-in-chief, even after other factors are controlled for.

⁷ Wiltshire entries contain information on ploughlands. The interpretation of ploughlands is discussed in Harvey (1975, p.187) and McDonald and Snooks (1986, p.67). A minor problem of interpretation is whether or not mill renders are included in the estate's annual value. Regression evidence indicates that, because the renders are relatively small, whether they are included or not has little effect on estimated relationships, see McDonald and Snooks (1986, p. 89-90).

⁸ The estimated tax relationships indicate that at all net income levels, on average, Wiltshire estates paid a higher tax. On average, for a Wiltshire estate a one percent increase in net income was associated with a 0.85 percent increase in assessment. For an Essex estate the increase was 0.71 percent. The first three quartiles of the BTI distributions were 1.5, 2.0 and 2.6, for Wiltshire estates, and 1.9, 3.1 and 4.7, for Essex estates.

⁶The dependent variable BTI data are restricted to lie in the interval of the real line on or above one. In McDonald (2009a), appropriate regression procedures when the dependent variable data are normalised and restricted in value are described. The simplest is least squares with standard errors calculated using White's (1980) heteroskedastic-consistent method.

Table 2. Least squares regressions of BTI on estate characteristics. Wiltshire and Essex lay estates, 1086 (heteroskedastic-consistent p-values).

Variables	Wiltshire p - values	Essex p - values
Tenant-in-chief	0.000**	0.017*
Hundred	0.000**	0.000**
Size (annual value)	0.098	0.000**
Arable/livestock mix	0.805	0.255
Tenure	0.023*	0.028*
Urban centre effect	-	0.002**
Number of observations	324	574
\bar{R}^2	0.17	0.17

Notes: * indicates significant at the five percent and ** significant at the one percent level.

Similarly, the hundred effect is highly significant, indicating that there was variation in tax treatment within the counties, across the local government areas. For both counties, beneficial treatment was not related to the arable/livestock mix of estate production.⁹

Two differences are apparent. First, in Essex the economic size of the estate was a factor affecting tax treatment. Smaller estates were treated more favourably, but no such association was found for Wiltshire. Secondly, for both counties, the BTI varied significantly with the tenure arrangement of the estate, but, for Wiltshire, estates worked by the tenant-in-chief were favoured above those worked by sub-tenants and for Essex the reverse was true.

Conclusion

The analysis of Domesday taxation on lay estates in Wiltshire and Essex strongly suggests that capacity of estates to pay the tax was a major factor determining the assessment – but other factors was also important. The capacity to pay relationship was stronger in Wiltshire than Essex and, as a consequence, the Wiltshire BTI values (which measure beneficial tax treatment received

by estates) tended to be lower.

For both counties, some tenants-in-chief received significantly more favourable treatment. In Essex there was some evidence that the less wealthy were favoured because the regression evidence indicates that, on average, tenants-in-chief with fewer estates in the county, smaller estates, and sub-tenants, received lower tax assessments. This was not the case in Wiltshire. There, on average, estates run by sub-tenants received higher assessments, and there is no evidence that smaller estates or tenants-in-chief with fewer estates received preferential assessments. For both counties there was a statistically significant hundred assessment differential.

This suggests that administrative factors affected tax assessments, maybe because assessments were made at different times in the hundreds, or with slightly more rigor in some hundreds than others. The results also indicate different tax rates across the two counties. There is little evidence that particular estate activities were granted tax concessions. In particular, the tax system did not favour arable activity over animal husbandry or vice versa.

The details of the levying of the geld are largely lost in time, but this study shows that much can be gleaned from information contained in Domesday book. Some understanding of the tax system is emerging, but many issues remain unresolved.

ACKNOWLEDGEMENTS

The author would like to thank Eva Aker and Beverley Vickers for their excellent research assistance, colleagues and seminar participants for their comments and The Australian Research Council and the Flinders University for financial support.

⁹ A variable measuring proximity to an urban centre was also entered as an explanatory variable in the Essex regression. For Essex, there were just two major urban centres, Colchester and Maldon, so it was relatively easy to locate estates close to an urban centre. In Wiltshire, there were many more boroughs (10), the situation is much more complex and hence the variable was not constructed. The proximity to an urban centre variable was significant in the Essex regression. The arable/livestock variable was also defined differently in the Essex regression. It was defined as livestock listed on the estate less cattle and beasts (which were associated with ploughing) divided by the number of ploughteams on the estate. Domesday Book does not list livestock numbers for Wiltshire estates.

REFERENCES

- Ballard A (1906). *The Domesday Inquest*. Methuen, London. 3Britnell RH, Campbell BMS (ed) (1995). *A Commercialising Economy: England 1086 to c. 1300*. Manchester University Press, Manchester.
- Brown RA (1984). *The Normans*. Boydell Press, Woodbridge.
- Clanchy MT (1983). *England and its Rulers, 1066-1272*. Fontana, Glasgow.
- Darby HC (1952). *The Domesday Geography of Eastern England*, reprinted 1971. Cambridge University Press, Cambridge.
- Darby HC (1977). *Domesday England*, reprinted 1979. Cambridge University Press, Cambridge.
- Galbraith VH (1961). *The Making of Domesday Book*. Clarendon Press, Oxford.
- Godfrey A, Hooper K (1996). Accountability and Decision-making in Feudal England: Domesday Book Revisited. *Acc. Hist.*, 1: 35-54.
- Hallam HE (1981). *Rural England 1066-1348*. Fontana, Brighton.
- Harvey SPJ (1975). *Domesday Book and Anglo-Norman Governance*. *Transac. Royal Hist. Soc.*, 25: 175-193.
- Hollister CW (1965). *The Military Organisation of Norman England*. Clarendon Press, Oxford.
- Lennard R (1959). *Rural England 1086-1135: A Study of Social and Agrarian Conditions*. Clarendon Press, Oxford.
- Loyn R (1962). *Anglo-Saxon England and the Norman Conquest*, reprinted 1981, Longman, London.
- Loyn R (1965). *The Norman Conquest*. Hillary House, London.
- Loyn R (1983). *The Governance of Anglo-Saxon England, 500-1087*. Edward Arnold, London.
- Maitland FW (1897). *Domesday Book and Beyond*, reprinted 1921, Cambridge University Press, Cambridge.
- McDonald J (1997). Manorial Efficiency in Domesday England, *J. Prod. Anal.*, 8: 199-213.
- McDonald J (1998). *Production Efficiency in Domesday England*. Routledge, London.
- McDonald J (2000). Domesday Economy: An Analysis of the English Economy Early in the Second Millennium. *Nat. Inst. Econ. Rev.*, 172: 105-114.
- McDonald J (2002). Tax Fairness in Eleventh Century England. *Account. Hist. J.*, 29: 173-193.
- McDonald J (2005). Using William the Conqueror's Accounting Record to Assess Manorial Efficiency. *Account. Hist.*, 10: 125-145.
- McDonald J (2009a). Using Least Squares and Tobit in Second Stage DEA Efficiency Analyses. *Eur. J. Operat. Res.*, 197: 792-798.
- McDonald J (2009b). Was Tax Policy After the Norman Conquest Determined by Ability to Pay? – Using Regression and Data Envelopment Analysis to Find the Answer. *Br. Tax Rev.* 3: 319-324.
- McDonald J (2010). Efficiency in the Domesday Economy, 1086: Evidence from Wiltshire Estates. *Appl. Econ.*, 42: 3231-3240.
- McDonald J and Snooks GD (1985a). Were the Tax Assessments of Domesday England Artificial? The Case of Essex. *Econ. Hist. Rev.*, 38: 353-373.
- McDonald J and Snooks GD (1985b). The Determinants of Manorial Income in Domesday England: Evidence from Essex. *J. Econ. Hist.*, 45: 541-556.
- McDonald J and Snooks GD (1985c). Statistical Analysis of Domesday Book (1086), *J. Royal Stat. Soc. series A*, 148: 147-160.
- McDonald J and Snooks GD (1986). *Domesday Economy: A New Approach to Anglo-Norman History*. Clarendon Press, Oxford.
- McDonald J and Snooks GD (1987a). The Suitability of Domesday Book for Cliometric Analysis. *Econ. Hist. Rev.*, 40: 252-261.
- McDonald J and Snooks GD (1987b). The Economics of Domesday England, in *Domesday Book Studies*, A. Williams (ed.), Alecto Historical Editions, London.
- McDonald J and Snooks GD (2003). *Domesday Economy*, Oxford Scholarship Online Edition, Oxford University Press, Oxford.
- Miller E, Hatcher J (1978). *Medieval England: Rural Society and Economic Change 1086-1348*. Longman, London.
- Morris J (1975). *Domesday Book: A Survey of the Counties of England*. Phillimore, Chichester.
- Oldroyd D (1997). Accounting in Anglo-Saxon England: Context and Evidence. *Acc. Hist.*, 2: 7-34.
- Postan MM (1966). *Medieval Agrarian Society in its Prime*. The Cambridge Economic History of Europe, Vol. 1, Postan MM (ed.). Cambridge University Press, Cambridge.
- Postan MM (1972). *The Medieval Economy and Society: An Economic History of Britain in the Middle Ages*. Weidenfeld and Nicolson, London.
- Round JH (1895). *Feudal England: Historical Studies on the Eleventh and Twelfth Centuries*, reprinted 1964. Allen & Unwin, London.
- Round JH (1903). *Essex Survey*, in *VCH Essex, Vol.1*, reprinted 1977. Dawson, London.
- Stenton DM (1951). *English Society in the Early Middle Ages*, reprinted 1983. Penguin, Harmondsworth.
- Victoria County History (1900). Oxford University Press, London.
- White H (1980). A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity. *Econometrica*. 48: 817-838.
- Williams A (ed) (1987). *Domesday Book Studies*. Alecto Historical Editions, London.
- Williams A, Martin BH (ed) (2003). *Domesday Book: A Complete Translation*. Alecto Historical Editions, London.