

Tithe Rent-Charge and the Measurement of Agricultural Production in mid-nineteenth-century England and Wales

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Abstract

Tithes represented a tenth of the natural increase of the produce of the soil paid by farmers to support the established church in the parishes of England and Wales. Traditionally, tithes were paid in kind, although in many parishes, some or all of them could be paid in money. The 1826 Tithe Commutation Act commuted all tithes in kind and customary money payments and substituted a fluctuating money payment known as a tithe rent-charge, which was to adjusted each year on the basis of the seven-year average price of wheat, barley, and oats. Since there is no direct method of measuring agricultural production before 1866, this value of rent-charge has the potential to be a useful measurement of agricultural output. The paper investigates the advantages, potentials, and problems associated with this source of data, using tithe material from Dorset as a case study.

THIS short note establishes some statistical relationships between tithe rent-charge – the values for which tithe liabilities were commuted in England and Wales under the terms of the 1836 Tithe Commutation Act – and the values of parish average annual land rental and land use recorded in the tithe surveys of Dorset. Tithe payments were a tax on the agricultural output of land, but conventional wisdom suggests that rent-charge values of *circa* 1836 do not bear any systematic relationship with actual output because the notional ‘tenth’ of output taken for tithe had by that time been much distorted by local tithing customs and practices. Our tests suggest the converse; in the aggregate tithe rent-charge values do vary systematically over space and there is a significant linear relationship between tithe rent-charge and the production-related variables of agricultural land rent and land use. It is not the object of this paper to explore the nature of the problematic relationship between rent and agricultural production but rather data on land rent and land use are used to demonstrate the *potential* of tithe rent-charge values to serve as an index

of agricultural output. We encourage further testing of tithe rent-charge values with data on *actual* agricultural production derived from sources such as estate accounts compiled independently of tithe surveys. In view of the dearth of general indicators of the spatial variation of agricultural production in the period before the systematic collection of agricultural statistics by the government, the prospect of tithe rent-charge being used as a surrogate index of agricultural production is indeed seductive.

I

For about 11,800 parishes and townships in England and Wales the values of tithe rent-charge are readily available in tithe apportionments held in county record offices and the Public Record Office. These sums were either agreed by local tithe owners and tithe payers or were awarded by an assistant tithe commissioner. The question which arises is whether these tithe rent-charges do in fact bear the direct relationship which they purport to the agricultural output of a parish and so can be used as surrogate measures of agricultural production.

At a local scale, records of tithe payments for periods of years have been used in a number of studies to measure changes in agricultural production. This approach was pioneered under the direction of Ernest Labrousse in France, and latterly has been coordinated and extended to a broader European canvas by Emmanuel Le Roy Ladurie and Joseph Goy.¹ Such studies are founded on the presumption that if the rate of tithe and tithable area remains constant, or if changes in either are known, and if tithe is levied on all crops and livestock, then the annual accounts of tithe will exactly reflect agricultural output. Localities for which there is a continuous run of such accounts are quite rare, though not as uncommon in France and Spain as in England. If temporal runs of tithe values are uncommon in England, then this country is unique in a European context in possessing data on tithe values for a large majority of its agricultural communities at a single date ie, c 1840.²

A comparative review of studies of tithe and agricultural production on the continent and England in 1979 noted that 'as yet there has been no study undertaken to test the tithe-production relationship in an English context'.³ Nor have tithe rent-charge data from c 1840 been used in such a way in the published literature. The presumption carried forward from the early 1960s, when tithe survey data were being extensively exploited by researchers based at University College London, is that factors such as moduses in lieu of tithes, customary compositions of tithe in kind for money payments, and exemptions of some properties or types of crops, produced such a variation in tithing practices such

that some tithe owners obtained levies quite close to the notional 'tenth' of the value of agricultural production in a district, while others, perhaps even in an adjoining parish, received only a fraction of this. It is undeniable that large disparities in tithe rent-charge per acre do occur between neighbouring parishes with similar soils and agricultural resources. This seems to have cast tithe rent-charge values in so bad a light that no formal testing of these data has been undertaken. What remains unclear is whether tithe rent-charge data are sufficiently trustworthy when used in the aggregate for large numbers of parishes to help identify broad regional differences in the value of agricultural production. It is a long-established maxim that all tithe data gain in strength if those for one parish are ranged alongside those of its neighbours, and those for one region against those of another.⁴

A principal difficulty with evaluating tithe rent-charge figures is obtaining a sample of equivalent size of values of another variable with which on a priori reasoning, tithe rent-charge might be expected to be directly related if it really is measuring agricultural production with tolerable accuracy. Ideal, of course, would be a set of statistics of agricultural outputs. Setting aside the fact that if such existed for the parishes of England and Wales c 1840 then the use of tithe rent-charge as a surrogate would be unnecessary, the nearest body of data in terms of size is that for the 7000 or so tithe districts where tithe was commuted by agreement, and for which data on cropping etc are recorded in the Tithe Commission's 'questionnaires' now preserved in the tithe files.⁵ Such a comparison would, though, be of little evaluative strength, as the output data in

¹ J Goy, and E Le Roy Ladurie, eds. *Les Fluctuations du produit de la dîme. Conjoncture décennale et domaniale de la fin du Moyen Age au XVIII^e siècle*, Paris, 1972; J Goy and E Le Roy Ladurie, *Tithe and agrarian history from the fourteenth to the nineteenth century*, CUP, 1982.

² R J P Kain, *An Atlas and Index of the Tithe Files of Mid-Nineteenth-Century England and Wales*, CUP, 1986.

³ Roger J P Kain, 'Tithe as an Index of Pre-industrial Agricultural Production', *Ag His Rev*, 27, 1979, p 80; Roger J P Kain and Hugh C Prince, *The Tithe Surveys of England and Wales*, CUP, 1985.

⁴ Roger J P Kain, 'The Land of Kent in the mid-Nineteenth Century', unpublished University of London PhD. thesis, 1973, p 102.

⁵ Roger J P Kain, 'The Tithe Files of the Mid-Nineteenth Century', in M Reed, ed, *Discovering Past Landscapes*, 1984, pp 56-84.

tithe file reports were used to assess the appropriate level of tithe rent-charge, and so tithe rent-charge and output data are not statistically independent. Data on crop acreages and yields from farm and estate records compiled independently of the tithe commutation process are not available in sufficient numbers to permit the broad, aggregate test that is required. A proportion of tithe files do, however, contain contemporaneous data on the rentable value of agricultural land in tithe districts at the same level of generality as tithe rent-charge data, ie, average annual rental of land in the tithe district as a whole.⁶ This paper compares such data on rentals and tithe rent-charge from Dorset, a county which displays a wide variety of agricultural ecosystems, from poor sandy heaths, through open chalk downlands to heavy clay vales.⁷ Dorset is also a county with good tithe survey coverage – 269 out of 285 tithe districts – and is thus a useful laboratory in which to test for the existence of systematic variation in tithe rent-charge in an objective manner.⁸ Our Dorset evidence suggests that the usefulness of tithe rent-charge may have been underestimated and that further testing of its relationship to agricultural output related variables in other parts of the country is merited.

II

In his unpublished University of Exeter thesis on the rural landscape of the Vale of Blackmore in Dorset, R F J Chiplen cites tithe rent-charges on arable land on the Inferior Oolite, Fuller's Earth Rock and

Forest Marble, of 9s 10d, 8s 4d, and 2s 11d respectively, adding that 'such differences would appear to be very closely related to soil fertility'.⁹

The mean value of tithe rent-charge per acre in Dorset was 3s 6½d and although values ranged from 8d at Winterborne Martin and Winterborne Whitchurch, to 9s 4d at Bradpole, there is a fairly small spread of data and values approximate to a normal distribution. Calculation of the standard deviation confirms that some 56 per cent of tithe districts have values that are within 1.5 standard deviations either side of the mean, ie, between 1s 4½d and 5s 8½d. The tithe districts with the most extreme values are listed in Table 1.

Some of the anecdotal evidence in assistant tithe commissioners' reports on Dorset commutation agreements supports the general contention that the natural productivity of a parish was a very important factor in affecting tithe rent-charge levels. For example, the parish of Studland, a very poor sandy area with scanty produce, had a tithe rent-charge of only 1s 3½d per acre. Aneurin Owen wrote in his report:

this parish consists principally of a low tract of infertile silicious soil covered for the most part by stunted furze, and appears to be incapable of any improvement but at a great and inadequate expense ... The tithable produce is scanty and not very easy of collection, and therefore the rentcharge agreed upon is an adequate compensation. The former incumbent had agreed to commute for £130, but as a professional surveyor had thought £140 would not be too high, the Agreement was effected with the present incumbent for £135.¹⁰

Conversely, in Hampreston the value of rent-charge per acre was 6s 4½d where tithe agent J. Milner reported in 1837 that:

The land is good particularly in the lower part of the Parish ... The arable land averages at 30s and the pasture and meadows at 40s per acre without the tithe ... The greater proportion of land in this

⁶ These data are available for all tithe districts where tithe was commuted by voluntary agreement (more than 50 per cent of parishes and townships) in those counties where 'pastoral farming' agreement questionnaires were employed. See R J P Kain, *An Atlas and Index of the Tithe Files of Mid-Nineteenth-Century England and Wales*, Cambridge, Cambridge University Press, 1986, pp 1–18.

⁷ Jennifer Gambier [now Jennifer Baker], 'Tithes, tithe commutation and agricultural improvement: a case study of Dorset c 1700–1850', unpublished University of Exeter PhD thesis, 1990.

⁸ Jennifer Gambier, 'Tithe free districts in Dorset at the time of tithe commutation', *Somerset and Dorset Notes and Queries*, 32, 1990, 823–27.

⁹ R F J Chiplen, 'The Rural Landscape of the Blackmore Vale circa 1840', Unpublished University of Exeter MA thesis, 1969, p 23.

¹⁰ PRO, Tithe Files IR18/1813.

TABLE 1
Extreme values of tithe rent-charge per acre in Dorset

<i>Rent-charge/acre less than 1s 7½d</i>		<i>Rent-charge/acre greater than 6s 5½d</i>	
Dewlish	1s 0d	Bradford Abbas	6s 10½d
Fairwood	1s 5d	Bradpole	9s 4d
Fleet	9d	Bridport	7s 7½d
Hamworthy	1s 3d	Burlestone	6s 7d
Hillfield	11d	Fordington	6s 8d
Hook	9½d	Shaftesbury Holy Trinity	8s 7½d
Melbury Sampford	1s 1½d	Walditch	7s 1d
Moreton	1s 6d	West End	7s 2d
Morden	1s 5d	Weymouth	7s 8½d
Steeple	1s 6d		
Studland	1s 3½d		

Source: see text.

parish is a good barley soil and in general well farmed.¹¹

Similarly, at Bradpole, where the rent-charge per acre was 9s 4d, John Baverstock Knight, the valuer, wrote that the best land here was of higher average rentable value than any land in the county.

III

For 144 Dorset tithe districts there is information on the average rentable value per acre, and comparison of tithe rent-charge and these rental data indicates that there is a significant linear relationship between the two variables, both visually as in Figure 1 and also statistically as evidenced by the correlation coefficient value of 0.554 which is significant at the 99 per cent confidence level.¹² Regression of these two variables produces the following regression equation:

$$\begin{aligned} \text{tithe rent-charge per acre} \\ = 0.0466 + 0.00574 \text{ average rental per acre} \end{aligned}$$

The T-ratio for average rental per acre is

¹¹ PRO, Tithe Files IR18/1691.

¹² The existence of a relationship between variables, for example tithe rent-charge per acre and average annual rental of land, can be observed from a graph, but the point of regression equations is to quantify the strength of this relationship and to identify other variables which are also relevant.

7.93, showing this parameter to be significant at the 99.9% confidence level.¹³ The regression analysis produced an R^2 value of 0.307 which is a measure of the proportion of the variation in Y, i.e. in tithe rent-charge per acre, which is 'explained' by the regression equation. Other variables related to agricultural production which might increase the explained variance and for which information is recorded in tithe apportionments are the percentage of arable land in a tithe district, the percentage of wood and other unfarmed land in a parish, and the percentage of orchards, fruit, market gardens or hops which bore a supplementary or extraordinary tithe rent-charge. Simple regression analyses produced R^2 values of 0.142 for arable, 0.141 for woods and 0.036 for orchards, market gardens and hops.¹⁴ By introducing these variables in addition to rental values into a

¹³ For more information on the T-test and F-test, see D R Pindyck, and D L Rubinfeld, *Econometric Models and Economic Forecasts* McGraw-Hill Book Co, Singapore, International Student Edition, 1981, pp 33-36.

¹⁴ Before using these variables together in a multiple regression analysis, simple descriptive statistics were first performed on each variable individually. A correlation was also performed. These tests show that there is a significant positive relationship at the 99.9% confidence level between tithe rent-charge per acre and the percentage of arable land in a tithe district (correlation = 0.377), a significant negative relationship between tithe rent-charge per acre and the percentage of woodland in a tithe district (correlation = -0.376), and a smaller positive relationship between tithe rent-charge per acre and the percentage of orchard, market gardens

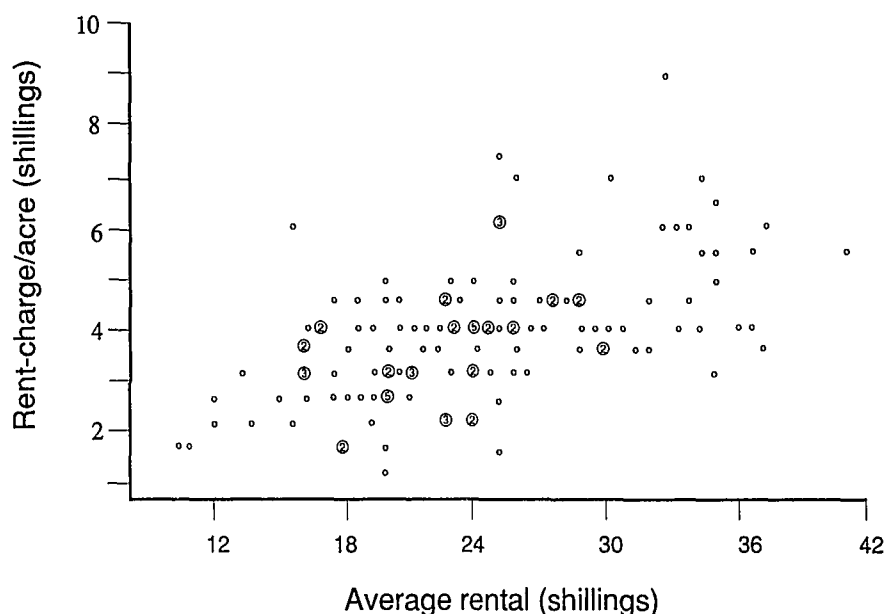


FIGURE 1

The relationship between tithe rent-charge per acre and average rentable value of land per acre in Dorset circa 1836.

multiple regression analysis, the following equation is produced:

tithe rent-charge per acre =
 $0.0308 + 0.00508 \text{ average rental per acre} + 0.00108 \text{ percentage arable land}$
 $- 0.00279 \text{ percentage woodland} +$
 $0.00708 \text{ percentage orchards, hops or market gardens}$

The T-ratios for each variable are all significant, so there is a statistically significant relationship between each of the independent variables and tithe rent-charge per acre and a total of 53.5 per cent of the variance is now explained.¹⁵

The presence or absence of moduses or similar customary payments or arrange-

ments in lieu of the full value of tithe undoubtedly reduced the level of tithe rent-charge per acre fixed under the terms of the 1836 Tithe Commutation Act.¹⁶ For example, at East Lulworth modus payments included:

The sum of Five Pounds as a Modus in lieu of all Vicarial Tithes of the Park Farm containing Two Hundred and Fifty acres. A sum of Two pence for each Cow depastured and fed in the said Parish and called or known as Cow white. The left shoulder of all calves killed by the owner, but a full tenth if sold to the Butcher. A sum of one half penny for every weanling Calf, but if the Farmer has Ten, the Tenth calf at seven weeks old. A sum of one penny for every garden. A sum of Four pence for every peck of Beans planted in Gardens in the said Parish.¹⁷

Moduses were in force in about eighty Dorset parishes c 1840 and by introducing a dummy variable representing moduses into the multiple regression analysis the R^2 value is increased to 0.584, thereby increasing the level of 'explanation' of the

and hops (correlation = 0.041). There is little correlation of the independent variables with each other, so they are suitable for use in a multiple correlation analysis.

¹⁵ The T-values are 'separate tests', i.e. they take each particular value and parameter in turn and test one after the other. The F-test takes all the parameters simultaneously and tests them. As this test is also significant, the joint null hypothesis that all the parameters are simultaneously equal to 0 is rejected, and the parameters are jointly significant in the regression model. A full discussion of the statistical procedures employed is provided in 'Tithes, tithe commutation and agricultural improvement...', pp 580-8.

¹⁶ Kain and Prince 'Tithe Surveys of England and Wales'..., pp 48-9.

¹⁷ DRO, Tithe Maps and Apportionments T/ELU.

TABLE 2
 Characteristics of tithe districts with large residuals

<i>Tithe District</i>	<i>Rent-charge/ acre</i>	<i>Rental/ acre</i>	<i>% arable</i>	<i>% wood</i>	<i>% orchard</i>	<i>modus</i>
Great Canford	4s 10 1/2d	20s	40.86	8.17	0.00	I
Morden	1s 5d	25s	16.46	3.42	0.00	I
Shaftesbury Holy Tr	8s 7 1/2d	32s 6d	32.08	0.00	5.97	0
Stourton Caundle	2s 6 1/2d	20s	14.10	0.52	7.05	0
Upcerne	3s 1d	25s 6d	94.98	6.75	0.00	0
Walditch	7s 1d	25s	55.52	1.42	6.76	0
Wyke Regis	6s 10 1/2d	30s	24.07	0.25	0.56	I

Source: see text.

model.¹⁸ Furthermore, analysis of the residuals in the regression analysis enables identification of those tithe districts where the regression model provides a poor fit. Tithe districts with large residuals are set out in Table 2, which shows that the most striking characteristics of each of these tithe districts are that: Canford has a relatively high proportion of wood; Morden has a very low value for tithe rent-charge per acre, but a high average rental; Shaftesbury has a high value for tithe rent-charge per acre, but an extremely high average rental; Stourton Caundle has a relatively large proportion of orchard and market garden land; Upcerne has an extremely high proportion of tithable land under arable cultivation; Walditch again has a reasonably high proportion of orchard land, and also of arable land; and lastly Wyke Regis, which has a high tithe rent-charge per acre, but also a very high average rental.

The ability to detect 'high leverage' data points which may be inordinately influential in determining the form and the fit of the model is as important as the ability to detect anomalous, ill-fitting data points using residual measures. The calculation of statistical parameters known as Dfits helps identify which extreme values exert such a disproportionate affect on the fit of the

regression model. If the data for Shaftesbury Holy Trinity, Stourton Caundle, and Upcerne are removed and the regression analysis rerun, the R^2 value increases to 0.627 showing an increased 'goodness of fit' and revealing that in the aggregate there is a very strong relationship between the combination of rental and land use variables and tithe rent-charge values.¹⁹ It is important to test any multiple regression model for heteroscedasticity and multicollinearity; neither causes a problem with this model.²⁰

IV

This paper has thus demonstrated that the general relationship between tithe rent-charge per acre and rent and land use is a strong one. However, at the resolution level of individual districts, particular circumstances can be all important. There is probably no better instance of this than at Godmanstone where James Jerwood reported in 1838 that 'an Estate the net Rental of which is £275 per annum has paid £80 a year for tithes which is 16/55ths

¹⁹ These observations have been returned to the model for the rest of the analysis.

²⁰ In the regression model it is assumed that the error variances are constant, ie, homoscedastic. However, if the spread of error variances around the regression line increases or decreases as the value of X increases, then heteroscedasticity is present. Another assumption of the multiple correlation model is that there is not an exact linear relationship between the independent variables in the model. Multicollinearity occurs when two or more variables (or combinations of variables) are highly (but not perfectly) correlated with each other.

¹⁸ The 'dummy' variable differs from the other variables in one important way: whereas normally a figure would be entered in each case, for example 18 per cent arable, a dummy variable is merely recorded as present or absent, using a figure of 1 or 0 respectively.

of the Rental or more than one fourth of the net profits arising from the estate'. Jerwood stated that all sides admitted that the rate of Commutation agreed on was much higher than in any of the neighbouring parishes, but adds that the rector has 'obtained no more than his average Receipt' and that 'the peculiar rights which the Titheowner had over the Lands in the Parish, to my mind, afford every satisfactory explanation - how that Receipt became so high in proportion to the value of the Parish'. The 'unusual right' of the tithe owner in this parish was that he was not only possessed the right of feeding a specified number of Cattle where he pleased on certain Lands in the Parish, but he also claimed the right of driving them *at any time* over other Lands whether those Lands were in Tillage or not. It was not therefore the value of the feeding the Cattle, but the annoying right of spoiling Crops &c which induced Mr Bridge to agree with the Titheowner

for the Right Tithes &c at so high a Rental in order that his tenants might be unmolested.²¹

Tithe rent-charge per acre may also have been higher when assistant tithe commissioners expected agriculture to substantially improve once tithes had been commuted.²² At Frome Vauchurch, Thomas Nippard wrote that,

this Estate is falling into hand, and as the Lives are not renewed, and when the lives drop considerable improvements will probably be made in farming 20 or 30 acres of water meadow, and otherwise by the usual system of agriculture under Covenants.²³

The average rental here was 30s per acre, but the usual average of such land in the neighbourhood was 25s per acre.

²¹ PRO, Tithe Files IR18/1686.

²² See R J P Kain 'Contemporary opinion concerning the possible conversion of pasture to arable after tithe commutation', *Cantium*, 6 1974, pp 77-9.

²³ PRO, Tithe Files IR18/1683.