Labour Contract Auctions in 19th Century Cornish Tin Mining

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Abstract

This paper considers the organisation of labour in the Cornish Tin mining industry in the 19th C. It uses primary records of labour bargains made at Wheal Hearle mine near St Just in the early 1860s. One of the main points of interest is that these bargains were allocated by auction on a monthly basis.

The work was of two types, “tutwork” and “tribute”, tutwork was work involved in digging levels, shafts etc within the mine whereas tribute was the payment for the raising of ore. Tutwork would usually be a rate per fathom dug, Tribute a sort of revenue share, were the group of miners would get so many shillings in the pound (value) of the tin ore. The paper will examine the relative variability of pay for the two types of work and the extent to which miners would switch between the two types of work.

The paper will also consider further implications of these arrangements, using data to examine the extent to which miners were able to use knowledge (of geology) to make good decisions on which bargains to bid for. It will do this by examining the structure of the distribution of earnings, and the extent to which groups of miners were able to earn persistently above the mean.

I Introduction

The Cornish tin industry is of great antiquity finding its beginnings in the early bronze age, see Buckley(1992). In this paper we concentrate on the labour market arrangements which were seen in the 19th century. The work was of two types, “tutwork” and “tribute”, tutwork was work involved in digging levels, shafts etc within the mine whereas tribute was the payment for the raising of ore. Tutwork would usually be a rate per fathom dug, Tribute a sort of revenue share, were the group of miners would get so many shillings in the pound (value) of the tin ore. One of the points of real interest is that the work was allocated, monthly by auction.

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The mine captain would mount an elevated place where he would be visible by all the assembled miners, the work would be described and a price offered. The price would be given and if there was a taker at this price the captain would take a pebble from his pocket, throw it in the air, if someone called out a lower price before it hit the ground, the process would be repeated, until the bargain was set. This is described in Price (1891) and Hamilton-Jenkins (1927).

II  Research Questions

The effective extraction of metals was an important part of the process of industrialisation seen in Britain through the 19th and 19th centuries. The first thing to highlight is the nature of the organisation of work. The auction mechanism described in the introduction performed a number of functions, it surely would drive the price of gaining the metal down but since the groups of miners didn’t have to bid for specific work packages if they didn’t think it was worth their while. Indeed I argue that this is one of the key elements of the relationship, it was valuable information to the employers which bargains the miners would want to take and those they didn’t. The auction arrangement for allocating bargains had two sides to it; on the one side it extracted information valuable to the employers and on the other hand it allowed the miners to use their knowledge and skill in assessing which bargains would be worthwhile and at what price. So I take a view that the miners were able to use their human capital to potentially earn some return, see also Burt and Kippen (2001). The idea of use of human capital will be a question I’ll return to in more detail soon.

Figure 1a George John’s Tribute Bargain for August 1861. Reproduced with permission of the Cornwall Record Office
The Captain’s price is 7/6 (7 shillings and 6 pence in the £); the contract specifies 4 men and is for one month (until the setting in August).

Figure 1b Payment recorded for same Tribute Bargain Also reproduced with permission of the Cornwall Record Office

We can see in figure 1b how this turned out for George and his men, the Tin ore raised is valued (as per book) at £50/2/6 and since he had contracted at 7/6 this paid out £18/15/11 minus costs of £5/13/4 netted them £13/2/7 between 4; so just about £3/6/0 for the month. I have been able to recover data for Tribute contracts at Wheale Hearle for 3 years August 1861 to August 1863 and for Tutwork contracts for slightly less time August 1861 to January 1863.

Figure 2 Histogram for Tribute earnings 1861-3 Wheale Hearle Mine
This is for 113 miner-months I have been able to extract from the Bargain books for Wheale Hearle. The Mean is £3.35, the Standard Deviation £2.01 with min and max £0.07 and £11.69 respectively.

Figure 3 Histogram for Tutwork earnings for Aug 61-Jan 63 Wheale Hearle Mine
This is for 63 miner-months with mean £3.02, Standard Deviation £1.38 and Min and Max £0.25 and £6.66 respectively. The most obvious difference is the lack of a right hand tail on the Tutwork distribution.

III Did miners move between the two types of contract?

The usual characterisation of the miners is that the Tributers were a distinct group that maybe regarded themselves as specialists, and indeed my suggestion that in bidding for contracts miners would be using their human capital to assess the value of the contracts, might support this assertion. The evaluation of tribute contracts is more likely to require specialist knowledge of geology than tutwork. However it appears that this was only partially true. Tributers would take tutwork bargains, and visa-versa, around 10% of the time, as the following cross tabulation suggests.

Table 1 Showing month on month transitions between Tribute and Tutwork Bargains

<table>
<thead>
<tr>
<th></th>
<th>Tribute</th>
<th>Tutwork</th>
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<tbody>
<tr>
<td>Tribute</td>
<td>88</td>
<td>8</td>
</tr>
<tr>
<td>Tutwork</td>
<td>4</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>92</td>
<td>49</td>
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IV Returns to Human Capital

These Tin miners in Cornwall in the early 1860s participated in a very interesting labour market institution; by bidding each month for the available bargains they were making quite complex decisions. The form of Dutch auction used required them to form a view of how much a given offered bargain would be worth to them; based on their knowledge of the geology of the mine workings, which they would have built up in various ways. If the bidding went below what they thought they could, in expectation, turn a profit. Then they would not bid further and at some point, they would consider switching to a tutwork (or tribute) bargain.
One way of looking at this from an empirical perspective is to see how individuals are moving within the histograms over time. The extent to which they tend stay above the mean, or not. This is essentially asking whether there exists any first-order autocorrelation in their net pay. The next figure gives some indication of this.

Figure 4 Non-parametric regression of net pay against lag of net pay

Local polynomial smooth
What appears to be indicated is that up to something a little below £10 per month there is some indication of a positive relationship between pay in the last month and pay this month. A linear regression over the range £0-10 suggests a significant relationship.

\[
\text{netpay}_t = 2.6876 + 0.2054\text{netpay}_{t-1} \quad N=138
\]

V Concluding thoughts

This draft reports my early work on analysing primary records of the earnings of Cornish Tin miners in one mine in the second part of the 19th C. It shows similar levels of earnings to other metal miners in Britain at this time, see Barmby (2016). Early results from the analysis give some support to the idea that miners were able to use some knowledge to choose which bargains to bid for and thereby generate some correlation in their earnings.

References
Buckley J A (1992) The Cornish Mining Industry Tor Mark Press, Penryn