Infuries in Particular Districts at Zonguldak

Zonguldak'ta Belklî Bölgelerdeki îşkamlan

Erol KAHVECİ *
Theo NICHOLS*

ABSTRACT

The paper compares the relation between productivity and injury rate in three Zonguldak coal districts, Karadon, Üzülmez, Kozlu. A preliminary correlation analysis for 1942-90 suggests that the relation is different at Kozlu. Further analysis for 1960-90 shows this district is the only one in which (a) a general steady or rising movement in productivity from the mid 1960s to the mid 1970s is associated with a falling injury rate and (b) a general fall in productivity until the mid 1980s is associated with a rise in injury rate. These differences are interpreted to be the result of variation in the combined effects of investment and of working conditions; in particular level, slope and thickness of seam.

OZET

Bu tebliğde, Zonguldak'taki Karadon, Üzülmez ve Kozlu bölgelerindeki üretim ile işkazalan oranları karşılaştırılmaktadır. 1942-1990 yılları için daha önceden yapılan korelasyon analizi bu ilişkinin Kozlu'da farklı olduğunu göstermektedir. 1960-1990 yılları için yapılan, analiz sadece bu bölgenin (a) 1960 ortalarından 1970 ortalarına kadar üretimdeki düzenli artışın işkazalan oranının düşmesiyle ve (b) 1980 ortalarına kadar üretimdeki genel bir düşüşün işkazalan oranındaki bir artış ile ilişkili olduğunu göstermektedir. Bu farklılıklar yatırım ve özellikle damar eğimi ve kalınlığı gibi çalışma şartlarının birleşik etkisindeki değişimin sonucu olarak yorumlanmaktadır.

(*) Researcher , Department of Sociology, University of Bristol, England
(**)'Professor, Department of Sociology, University of Bristol, England

In 1990 three major coal districts which had existed throughout the period reviewed, Karadon, Uzulmez and Kozlu, accounted for over 80 per cent of total underground employment and 83 per cent of production at Zonguldak. As can be seen from Table 1 me general relationship found between productivity and the injury rate which has applied in the Zonguldak coal basin as a whole is also to be found in the first two of these districts.

Table 1

Correlation between productivity and injury rate
1942-1990

Zonguldak whole basin	0.802
Karadon	0.798
Uzulmez	0.789
Kozlu	0.283

The third district, Kozlu, requires more detailed comment precisely because it does not appear to fit this pattern.

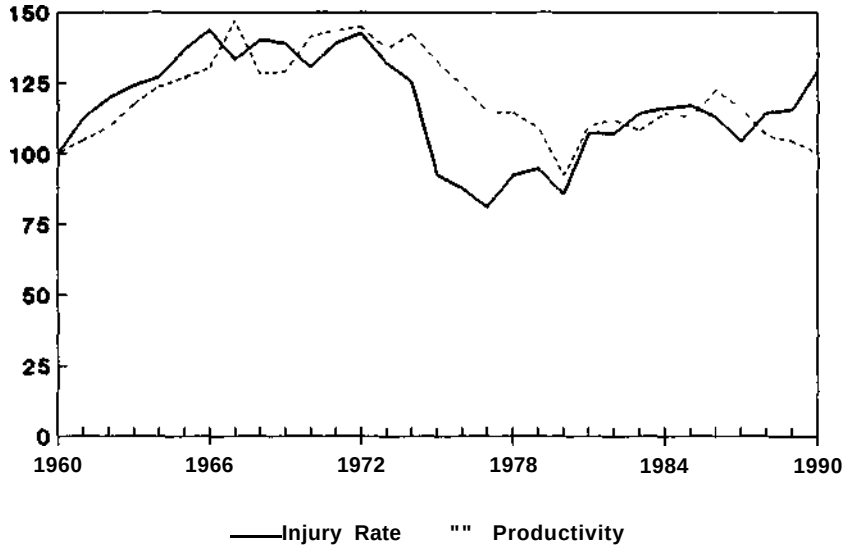
Comparison between Kozlu and the rest of the coal basin is made difficult over the entire half century by the effects of the disaster at Kozlu in 1947. But an examination over the last 30 years of differences in the relation between productivity and injury at Kozlu and in the rest of the basin is instructive. The generally close relation between the path followed by productivity and the industrial injury rate can be seen from Figure 1. But two differences stand out in Figure 2.

Difference *(a)*: A general steady or rising movement in productivity from the mid 1960s to the mid 1970s was associated, at Kozlu only, with a falling injury rate.
Rising productivity is likely to be accompanied by a falling injury rate where productivity is investment-driven. This raises the question whether there was more investment at Kozlu than elsewhere in the early period. Only limited information is available about the precise nature and distribution of investment between districts. But it is known that the second

FIGURE 1

Injury Rate and Productivity in the

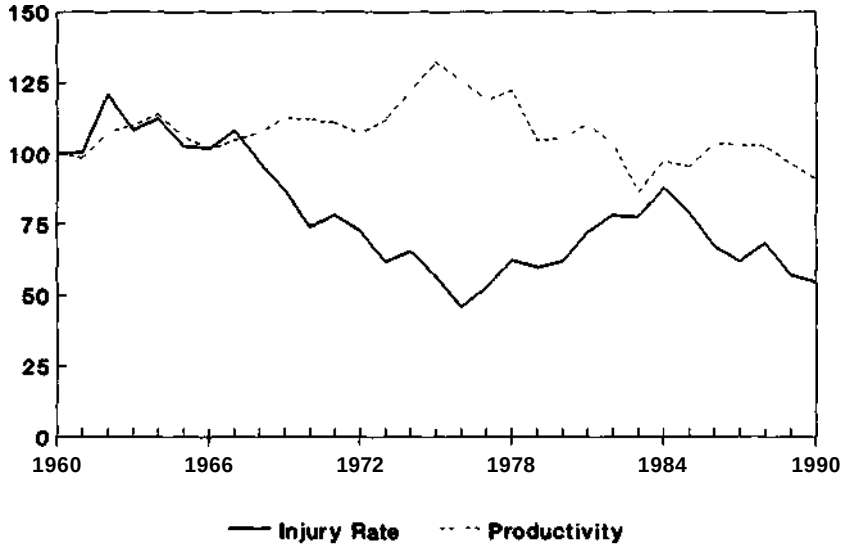
Rest of The Basin 1960-1990



1960-100

FIGURE 2

Injury Rate and Productivity at Kozlu 1960-1990



1960-100

main investment period occurred during 1966 and 1977 and it can be seen from Table 2 that the correlation between this investment and productivity is also different at Kozlu from elsewhere. The positive relation found between investment and productivity for Kozlu is not to be found for either Karadon or Uzulmez or for the whole of the rest of the basin except for Kozlu. It is difficult to resist the conclusion that the injury rate at Kozlu did not rise but fell with increased productivity because Kozlu had benefited disproportionately from increased investment. In short, between the mid 1960s and 1970s Kozlu was an exception that proved the rule - the rule being that, in the basin as a whole, productivity made for injury.

Table 2

Investment, Productivity and Injury Rate:

Kozlu and the Rest of the Coal Basin Compared 1966-1977

	Investment and Productivity	Productivity and Injury
Kozlu	0.677	-0.812
Karadon	-0.657	0.898
Uzulmez	-0.677	0.567
Rest of basin	-0.233	0.677

If Kozlu benefited disproportionately from investment in the earlier period, it also operated in favourable conditions. As can be seen from Table 3, in one respect, these favourable conditions continued to apply thereafter for mining at Kozlu has continued to be

Table 3

The Concentration of Mining Operations 1990

District	Sq Km Covered	Underground Miners
Kozlu	12	4456
Karadon	32	7422
Uzulmez	28	4894

significantly more concentrated than at other districts in the basin. For this reason alone, other things being equal, investment at Kozlu has been more likely to be effective. But at Kozlu itself other things were not equal between the mid 1960s and mid 1970s, and the mid 1970s and the mid 1980s. This brings us to the second difference between Kozlu and the rest of the basin.

Difference (b)*:* A general fall in productivity until the mid 1980s was associated, at Kozlu only, with a rise in injury rate.

A change that occurred at Kozlu between the mid 60s to the mid 70s and the mid 70s to the mid 80s goes a considerable way to explain why, at Kozlu only, there was a rise in injury rate accompanied by a fall in productivity. By way of background, since 1953 there have been two main shafts at Kozlu. These have access to three main galleries between -200m and -425m. It is safer to get coal between these levels because the galleries can be used in order to transport tools and coal between the coal face and the surface. They permit the use of 5 ton waggons for shipping tools and pit-props and coal. But outside the -200 and -425 levels there are no main galleries to serve the coalface, big waggons cannot be used, pit props and coal and tools have to be shifted by one ton waggons and generally coalmining becomes more labour intensive.

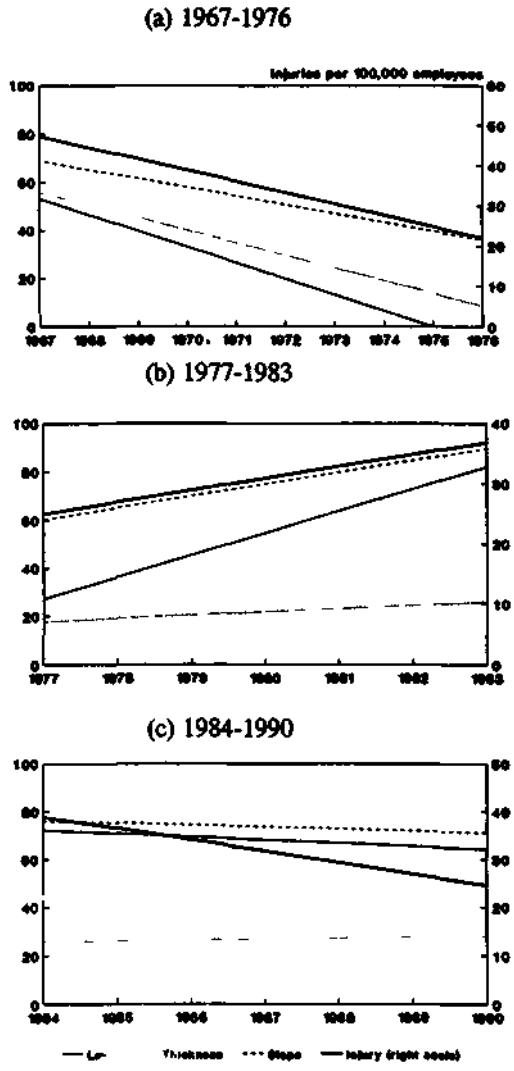
During 1967 to 1976 - when the Kozlu injury rate went down and productivity went up - the proportion of production that took place outside the two main levels fell

substantially, from 64 per cent to only 12 per cent. Consequent upon this, changes occurred which made for safer working. There was a reduction in work in thin seams. There was also a reduction in the proportion of production which took place in more steeply sloped conditions. The direction of these trends can be clearly seen from Figure 3a, as can the trend in the injury rate.

After 1976, by contrast, mining at Kozlu began at deeper levels and without main shaft access. It therefore took place under more adverse conditions from 1977 to 1983 - the very period when the injury rate rose at Kozlu, even though productivity fell. A failure to make adequate additional investment meant that the proportion of production which took place outside the two main levels underwent a more or less steady increase to 78 per cent. This entailed, as noted earlier, working at lower levels (for instance at -485m or -560m) where there were no main galleries and no direct access by shaft. It also involved working nearer to the surface (for instance at between +230/+290 or +25/-30), where once again there were no main galleries and no direct access by shaft. Working at these other levels took place in attempts to fulfil production plans prior to the completion of a new shaft. Such operations made it more likely that miners would confront thinner seams and greater slopes. A simple illustration of the increasing difficulties met in mining at Kozlu is that in 1990 26 levels were worked whereas at the beginning of the second period, in the mid 1970s, only nine or ten different levels had been.

FIGURE 3

Working Conditions at Kozlu



Notes:

Level: Percentage of coal production that took place outside the **two main levels** (-200 and -425 metres).

Thickness: Percentage of coal production that took place in seams of **between 0.7 and 2** metres (i.e. relatively 'thin' seams).

Slope: Percentage of coal production that took place in seams of **between 21 and 45** degrees (i.e. in steeply sloped ones).

Between 1977 and 1983 there was an increase both in the percentage of production at Kozlu which took place in more steeply sloped conditions and in the percentage of production which took place in thinner seams (Figure 3b). The very same indicators that had suggested beneficent conditions at Kozlu between the mid 1960s and 70s pointed to adverse conditions between the mid 1970s and mid 1980s. As can be seen from Figure 3b, this time the trends were up, not down.

For the sake of completeness information on Kozlu for the mid to late 1980s is provided in Fig 3c. It will be seen that for these years there is a lack of any pronounced movement in the injury rate which conforms to a lack of definite increase or decrease in the thickness, level or slope of seam.

It has already been seen that tools and transport injuries and injuries associated with falling ground were a substantial part of the basin's total injuries over 1942-1990 and that each of these categories of injury had a close positive relation to productivity. During 1967 to 1977 - years that saw increased investment - tools and transport injuries fell at Kozlu by 42 per cent whereas in the rest of the basin they rose by 23 per cent. Injuries from falling ground at Kozlu fell by 68 per cent compared to a smaller 21 per cent fall in the rest of the basin. For the period 1977 to 1983, by contrast, tools and transport injuries increased at Kozlu by 63 per cent compared to a smaller 44 per cent increase in the rest of the basin. Falling ground injuries increased at Kozlu 45 per cent, this again compared to a smaller increase of 22 per cent in the rest of the basin.

Both the analysis of specific causes of injury and this detailed analysis by district confirm the underlying interpretation that the injury rate at Zonguldak has been closely associated with productivity over this last half century. An attempt to take into account the different conditions that pertain in different districts and at different times only reinforces the importance to injury causation at Zonguldak of the

manner in which productivity is achieved and, behind this, of the lack of investment and the relatively low level of technology.

Data Appendix

Data on slopes and thickness of seam from TTK Yillik Faaliyet Raporu 1966-90. Data on level from EKI Gunluk Ve Aylik istihsal Programi 1960-90.

Information on aggregate investment 1940-1992 is from Türkiye Taşkömürü Kurumu Yatirimlari. Detailed breakdowns of investment by district and specific purpose are only available from 1983.