

THE EAST RAND

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THE EAST RAND

A Geographical Analysis of the Transition of the
Economic Base of the Region from Gold Mining to
Manufacturing, and its Effects upon Future Economic
and Spatial Development.

By

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This thesis is presented in
fulfilment of the requirements for the
degree of Master of Arts, in the
University of the Witwatersrand.

Declaration

This is to declare that this
thesis is my own unaided work and
has not been previously submitted
for any degree in any other
university.

P. J. Schreier

22nd Jan. 1970

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Those firms questioned in the Industrial
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INTRODUCTION

Gold mining has provided the base of the South African economy since the 1890's. Throughout this period there has been a constant process of the predominant mining zones moving, east, west and south-west, away from the original exploitation of the Main Reef outcrop at Johannesburg, to the East Rand, the West Wit line, Klerksdorp, Kinross-Evander, and the Orange Free State. Only recently however has the impact of decline affected the older gold mining areas, namely those comprising the West Rand, Central Rand and East Rand. It is with just one of these areas, namely the East Rand, that this study is concerned, to analyse how new locational forces and the legacy of gold mining have governed its spatial and economic adaptation, and how they will affect future development.

Minerals are wasting resources, and correspondingly, the economic development surrounding mineral extraction in particular localities, has often declined with the closure of the mines, resulting in 'ghost-towns'. Whether or not the urban economy associated with mining declines or not depends upon the ability of the locality to attract other basic industries to support the tertiary activities created by the local income generated by gold mining.

An urban area's economy can be seen to consist of two sectors, 'basic' and 'non-basic'. Briefly described, the basic sector consists of that part of the urban economy which is composed of activities whose principal functions are those of exporting goods, services and capital beyond the economic boundaries of the locality, whilst the economic complement of the base, the non-basic activities, are engaged in the sales of goods, services and capital within the locality. By selling goods outside the locality the basic sector activities cause the inflow of income into the area,

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part of which is spent locally, creating the purchasing power for goods and services from the non-basic sector.

From this dichotomy in the local economy can be understood the basic mechanics of local economic growth and decline. A decline in export activities will lead to an eventual decline in income and employment in the non-basic sector through a decline in the aggregate income of the community and a multiple decline in the value of expenditure on non-basic activities. The urban economic base multiplier asserts a close and direct correspondence between the basic and non-basic variables, the causal link of which, although not being as strong as many writers have believed, definitely exists, and, as Andrews perceived,

" If a community's trade balance becomes negative for a considerable period of time, or if the exporting functions decline in activity ... an eventual demand adjustment in total community population is almost certain to result " (Andrews, 1953).

Within the East Rand, industry has been slow to develop and by 1950 gold mining could be considered the only basic industry,

" ...secondary industry, commerce and administration ...were still too immaturely developed to be regarded as large regional importers of capital" (N.R.D.C., 1960).

Hence with the rapid decline in gold mining in the region foreseen, there were many pessimistic forecasts of the 'economic fate' of the East Rand towns, and calls for government assistance. In fact, in 1960 an N.R.D.C. Report forecast,

" ...that certain parts of the outer zone " (West Rand and East Rand), ... " will face serious economic embarrassment in the next decade as present trends indicate not only a net loss in the gross value of production from its two basic activities " (gold mining and secondary industry), ... " but also a net loss in the aggregate amount paid out in wages and salaries by these industries " (N.R.D.C., 1960).

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Despite the fact that no assistance from central government was forthcoming, the non-basic activities of the East Rand have withstood the closure of ten mines in the last eight years, although the development of secondary industry as a basic activity has not matched this decline in terms of employment. The reason for this fact will be explained in Chapter 4, in terms of a dynamic analysis of the economic base of the region between 1951 and 1963/64.

Not only is this transition significant in terms of the 'economic survival' of the region, the transition from the economic base of gold mining to manufacturing has also had great effects upon the spatial pattern of development, and the composition of the local community, both of which will be examined.

Developing from the analysis of the transition of the economic base, the study will attempt to forecast future 'economic growth' ^I in the region. Unfortunately in the South African context, with an inadequate statistical base, no one quantitative method can achieve this. The study therefore has to use various methods of analysis and combine their results subjectively.

In considering in greater detail the new manufacturing base of the region, and its locational and market relationships, a sample industrial survey of the firms in the region was conducted, to give results on location factors and input-output patterns of manufacture. As the results of this survey showed the integration of the East Rand into

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I. 'Economic Growth' . In this sense defined as an increase in a regions level of total output.

the P-W-V Industrial Region it is necessary to analyse the industrialisation of the P-W-V, to see to what extent the basic activities are complementary or competitive, the distribution of growth industries, and the factors influencing future patterns of manufacturing growth in the region.

The analysis of the economic base of the East Rand, and its relation to the locational and growth patterns of manufacturing in the P-W-V will show the implemental factors for economic growth in the East Rand. Only through a consideration of the permissive factors, the natural resources of the region, and the factors affecting them, can actual growth be predicted. Hence these factors such as water and power supplies, communications, and the two more unknown variables of land and labour, will be considered in Chapter 7, before analysing the interaction of the permissive and implemental factors to realise future economic growth and its spatial distribution in the East Rand.

/ CHAPTER I

CHAPTER I

DEFINITION OF REGION

The decline of gold mining, the main *raison d'être* economically of the Witwatersrand metropolitan complex, has led to differing severity of economic problems in the component zones of the complex. In the Central Zone, the area directly south of Johannesburg, the main problem has been the utilisation and incorporation of released mining land. For other areas the problem has not been a matter of re-orientation of land use, but of re-orientation of the local economy to replace the basic income earned by mining. Understandably, in a region the original economic base of which is 'dying', much attention has been attracted to the possible effects of this decline. The Marginal Mines Research Unit (University of the Witwatersrand 1961-1964) did much work in analysing the 'vulnerable mines', preparing forecasts of the economic consequences of these closures upon separate zones, and in campaigning for government action to alleviate some of these effects (Marginal Mines Research Unit, 1964). In the last six years however, since these forecasts were made, economic facts have tended to invalidate many of them, and the type of study that is now necessary is that of the adaptation to a new economic base, and the probable economic and geographical effects resulting from this in the future.

For the purposes of this study the region, as delimited, must satisfy two criteria. Firstly, that it is a separate zone of the 'Marginal Mines Region' of the Witwatersrand, with problems of adaptation peculiar to this zone. Secondly, that it is a region suitable for economic base analysis.

/ Zone

Zone of Marginal Mines Region

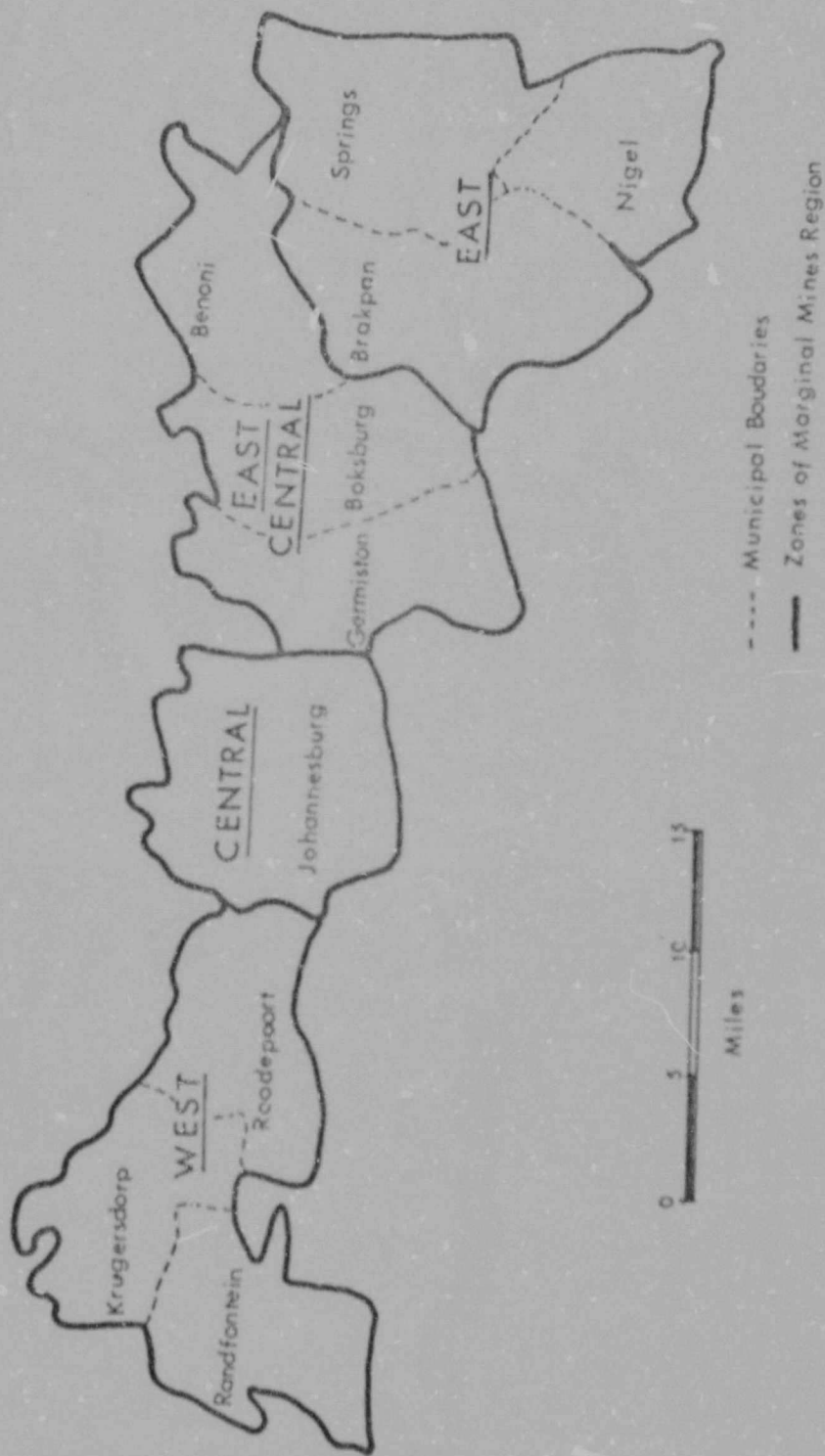
The Marginal Mines Region, as defined by the Marginal Mines Research Unit, was based upon magisterial district boundaries. In respect of the East Rand, as will be shown later in the chapter, for purposes of other analysis these boundaries are unsuitable and hence the Marginal Mines Region has been redrawn, based upon municipal boundaries (Figure I). Four zones were differentiated by the Marginal Mines Research Unit ; the West, comprising Krugersdorp, Randfontein and Roodepoort ; the Central Zone of Johannesburg ; the East Central Zone of Germiston, Boksburg and Benoni ; and the East Zone of Brakpan, Springs and Nigel.

It was in the outer zones of the Witwatersrand, both heavily dependant on the gold mining industry, that the consequences of a mining decline were likely to be concentrated. Figure 2 illustrates the concentrated nature of the closure of the gold mines between 1960 and 1975 upon the mining land of operating companies in the different zones. It is obvious at a glance that the bulk of these closures occur in the East, West and Central Zones, with very few closures in the East Central Zone. The Central Zone however, as a result of the smaller proportion of regional income and labour employed in its gold mines, would easily be able to counteract the effects of the closures. It was in the East and West Zones, both heavily dependent upon gold mining, that localised problems in the dislocation of industrial structure were forecast (N.R.D.C. 1957 and 1960).

In respect of the distribution of employment between industry and mining the Witwatersrand can easily be separated into two zones, the Inner (Central and East Central), and the Outer (East and West). Absolute employment

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Figure 1 ZONES OF THE MARGINAL MINES REGION OF THE WITWATERSRAND

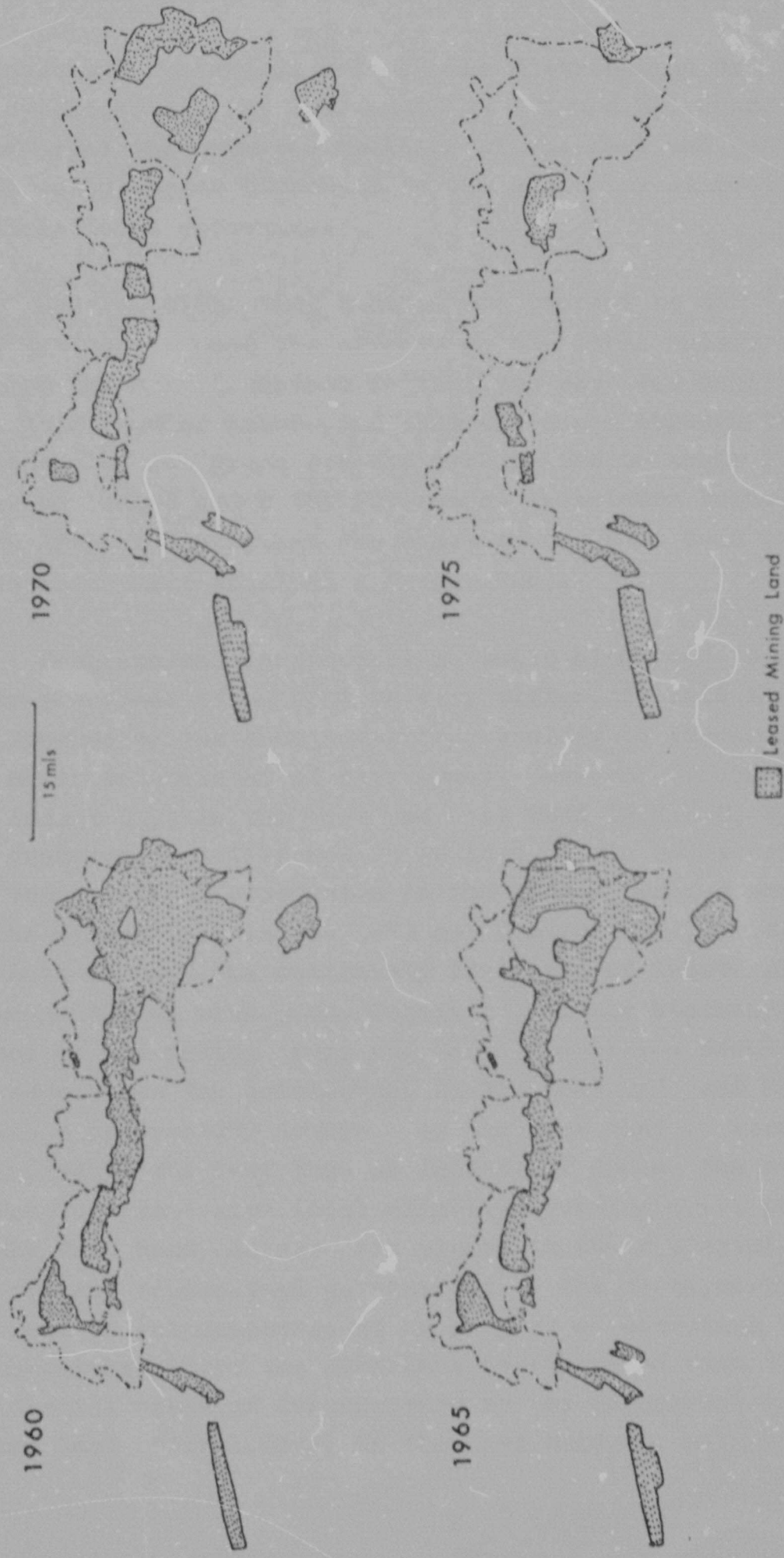


Source: M.M.R.U. Report 1964

Figure 2

GOLD MINING IN THE WITWATERSRAND 1960-1975

- Mining land leased by operating companies



N.B. Estimates for 1970 and 1975 exclude the possibility of a rise in the price of gold and are based on lifespan estimates in the Mining Journal Quarterly Review of Gold Shares.

in these two sectors, as well as the distribution of employment, brings out this contrast (Figure 3). Hence at first sight the economic problems of the East and West Zones would appear identical in the necessary adaptation of their local economies.

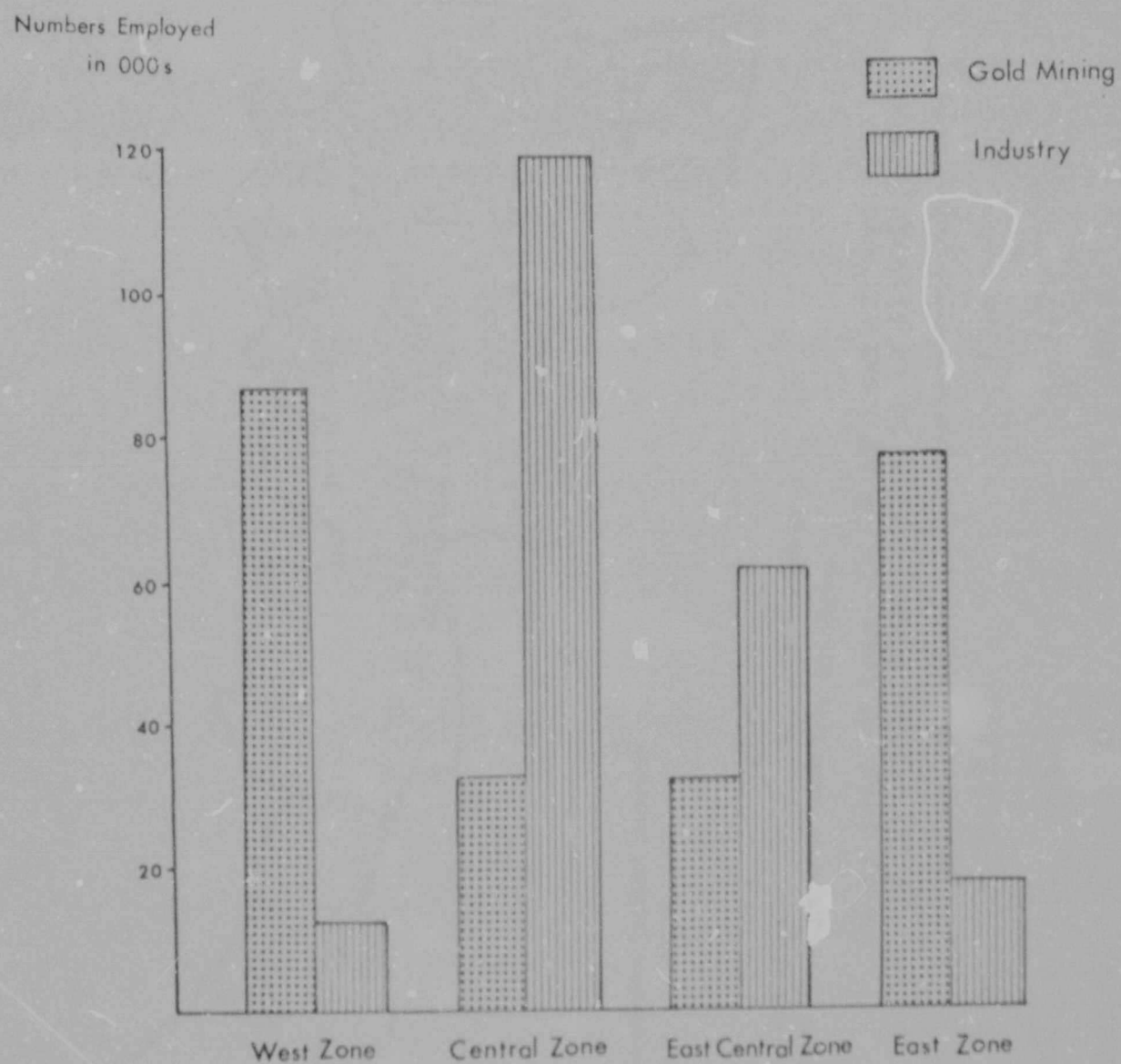
Several mitigating factors are present in the West Zone however to ease the effects on the local economy. Perhaps the most important is that the expected decline is of a more regular nature, and that the mines through the existence of low grade ore are more suited to their lives being prolonged under the Government Assistance Formula to South African Mines, than the mines in the East Rand (Gold Mines Assistance Act, 1968 ; Krige, 1968).

Geographical considerations would also tend to make their processes of adaptation very different. This is a consequence of the changeover from geology to topography as the major determinant of development patterns (residential and industrial) in the East and West Rand (N.R.D.C. 1960). The fundamental difference in geology of the two zones has its topographical expression in the ridges running north of the mining belt in the West and Central Rand, whilst in the East in open and relatively flat land of indeterminate drainage filled with pans. Together with the historical legacy of the mining areas and their associated development, the advantages for development in the East and West Rand assume a contrasting nature - in the West Rand as residential areas, and in the East Rand as industrial areas. The ridges in the West Rand give local climatic advantages, not present in the East Rand, and are well placed in their proximity to the present residential development to the north, north-west and west of Johannesburg, and in respect of commuting to Johannesburg, whilst the East Rand is separated from the residential areas of Johannesburg by the industrial areas of the East Central Zone. In the East Rand, the main area in

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Figure 3 DISTRIBUTION OF EMPLOYMENT BETWEEN GOLD MINING
& INDUSTRY IN ZONES OF THE WITWATERSRAND

1960



Sources : Statistics from the Bureau of Census and Statistics and the MMRU Report

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