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Title: The Efficiency of the Sind Date Marketing System

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ABSTRACT:

The aim of this paper is to analyse and evaluate production and exchange efficiency in the Sind date marketing system.

At present there are certain difficulties in interpretation and measurement, but despite these, criteria of "workable" competition, provided a satisfactory theoretical and analytical framework. A fragmented production structure is identified and this is associated with inefficient use of resources. Considerable variation in production efficiency between districts is evident. Efficiency at wholesale level is related to firm size and business functions performed.

دراسة وتحليل وحساب الانتاج ومعامل التغير في نظام تسويق التمور في السند
رزاقى منير علي شاه. جون ديفز

الخلاصة:

تهدف هذه الدراسة الى تحليل وحساب الانتاج ومعامل التغير في نظام تسويق تمور السند. توجد في الوقت الحاضر بعض الصعوبات في التفسيرات والقياس. ولكن بالرغم من ذلك فان معايير العمل والمنافسة تغطي قواعد نظرية وتحليلية مرضية. ثم تشخيص عملية الانتاج وهذه لها علاقة بالاستعمال غير الامثل للمواد وأن الاختلاف الملحوظ في معامل الانتاج بين المقاطعات يعتبر كدليل على ذلك وأن الكفاءة في مستوى التسويق يعود الى الحجم الرصين والاعمال المنجزة.

INTRODUCTION

This paper reports the results of the final part of a three part study on the structure, conduct and performance of the date market in Sind, Pakistan. Results of the first two stages were reported in earlier papers by Rizvi and Davis (1985) and (1986).

The relative efficiency of production and exchange has considerable impact on the welfare of enterprises producing and marketing dates. Efficiency is also a matter of concern to the consuming public since it ultimately affects the prices paid by consumers. According to Kohls and Uhl (1980), marketing efficiency can be increased in two ways. Any marketing change that reduces the costs of performing the functions without altering the marketing utilities would clearly be an improvement in marketing efficiency. Alternatively, enhancing the utility output of marketing process without increasing marketing costs, would also increase efficiency. According to Gibbons (1970), production is deemed to be efficient when the required output is obtained with minimal resource input. In simple terms, the aim is to use and allocate resources efficiently in order to maximise the output-input ratio.

Production Level

In order to evaluate efficiency at the date orchard level in Sind, analytical coverage was extended to the two main date producing districts (viz Khairpur and Sukkur) in Sind. Together these cover 96.5 per cent of total date production in Sind. The period of analysis covered only one year, ie 1983-84. Clearly, this restricts the conclusions which can be drawn from the analysis.

Efficiency at orchard level has been measured as a ratio of input to output:

Total costs

----- = Average cost per rupee of output

Total Revenue

Thus, this measure reflects both the quantity of an orchard output and the average prices (date variety/form wise) received. Similarly, total costs (establishment, fixed, semi-fixed and variable costs) incurred in production and marketing were divided by the total quantity of output to get the unit costs (rupee per maund¹) in each size group, by district.

1. "Per maund" has been used as "Unit" equivalent to 40 kg.

To measure production efficiency in agriculture, the usual procedure is to compare the costs and returns of the individual farms with a group or regional "average" and sometimes with the "most efficient" level. (Davis (1976) has pointed out two drawbacks of this methodology.

(a) It is not a normative comparison, since it only shows what has been achieved in practice and can not indicate what the level of efficiency should be.

(b) On an interregional basis it is only meaningful to make comparisons between "broadly similar" farm types.

However, in the end he concluded that it was a "workable" approach to the problem of efficiency measurement.

Due to lack of precedent data, it is difficult to know if a date orchard is operating at the "maximum attainable production efficiency" or "lying within it" and even what the "lowest costs" are for a given production process. Despite these drawbacks, the methodology is valid and useful for analysing whether the efficiency of resource use in one size group or district is better in relation to other size groups or district. It is also one means by which a quantitative association between structure, conduct and performance may be determined. Therefore, considering the limited data available, the only practical method for measuring efficiency at the date orchard level is to compare the efficiency between the different size group orchards on a total input-output basis during the same time period.

Firstly, this methodology was applied to the Khairpur district (within different size groups) because date orchards in this district are of a "broadly similar" type and, thereafter, a comparison was made between efficiency in two districts (viz Khairpur and Sukkur). A straight comparison of this kind between the different size groups in the two districts needs to take account of the following limitations.

(a) Khairpur district is popular for the "Asil" variety whereas, most of the plantings in the Sukkur district are of the "Fasli" variety and yields here have been declining. The date growers in the Sukkur district were therefore reluctant to incur high production costs in these old orchards. In contrast, growers in the Khairpur district were keen to invest, in order to get better yields. Therefore, the differences between date variety, yield and costs, prohibit a straight comparison between the date orchards of the two districts.

(b) Khairpur has a natural advantage in date production due to superior soil. The water table is high in this district and irrigation has a significant impact on the date output.

1. Karachi division has 3 districts, but here is counted as one district.

Wholesale Level

At wholesale level, due to non-availability of pricing data from each district market, the analytical coverage extends to the three main wholesale markets viz Sukkur, Hyderabad and Karachi¹, which together account for 62.4 per cent of the total quantity marketed through Sind auction market. The remaining quantity was sold through the other ten district markets in Sind. The efficiency of the procurement centres, who handled 18 per cent of the total production in Sind, has been omitted due to lack of authentic costs/benefit data from these centres.

The three aspects of efficiency at wholesale level evaluated are, labour productivity, economies of size and capacity utilisation. For analytical purposes, comparisons are made between Sukkur, Hyderabad and Karachi wholesale markets using as a unit of measurement rupees per maund handled by each wholesale firm. The reason for comparing these geographically separated markets in Sind province, is the lack of a "standard" measure upon which to base such an analysis of efficiency. In order to restrict the comparisons to the "broadly similar" wholesale firms, the calculations for the two main types of wholesale firms ie.

Types A and B¹ are made separately (Rizvi and Davis, 1985). A straight comparison between two types of firms could be misleading due to differences in their marketing functions, methods and costs of business operation. Similarly, the firms handling unprocessed (fresh) dates exclusively were not included in this study because: (i) there is a significant difference in the prices and costs between processed (dry and dehydrated) and unprocessed dates, and; (ii) the trade period for the unprocessed dates is limited to the date season only.

Retail level

Measurement of efficiency at retail level is rather difficult. The analysis is therefore limited to two components of the operating costs-total fixed costs² and per maund variable costs.

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1. Both these firms are distinguished by their marketing functions. Type "A" wholesale firms work as auctioneers in the same market and provide loan and other market facilities to the date sellers and buyers exclusively.
 2. The fixed costs incurred exclusively on date trade by a retailer could not be easily separated, due to the typically diversified nature of retail shops coupled with their poor accounting records.

EMPIRICAL FINDINGS**1- EFFICIENCY IN THE PRODUCTION SECTOR****1.1 Khairpur district**

Table 1 shows that the lower average operating costs (ie. Rupees 65/87 per maund) of the largest size group which suggests superior efficiency in this group. However, at Khairpur date orchard level, there are many external factors influencing yields over which managerial decisions of date growers have little direct control. Interestingly, the smallest size group earned higher average revenues (ie. Rupees 201.07 per maund) than the two larger groups. This was a consequence of the outlet to which date growers in larger size groups sold their output ie. to the procurement centres. If the date growers behave rationally¹, it would be expected that they would sell their surpluses to the most rewarding outlet. However, such choice depends also on the feasible outlets available and the financial conditions prevailing in the Sind date market.

It is apparent that the average fixed production costs incurred by the smallest size group (ie. Rupees 25/34 per maund) are lower than the larger size groups. This suggests that further research is required to determine the relationship between size and efficiency. Whether or not such a relationship does exist, one can not assume that the largest size group had the greater efficiency, since a lot of other natural and individual factors can influence production efficiency. Nevertheless, the lower unit costs of the largest size group does suggest that economies of size do exist although the precise magnitude of these economies due to size alone would require further research.

1.2 Comparative production efficiency of Khairpur and Sukkur districts

Table 2 shows measures of overall efficiency in each district. This analysis shows that the fixed production costs (ie. Rupees 25/88 per maund) incurred by the Khairpur date growers are 142.3 per cent higher than the Sukkur date growers. However, net income per maund (ie. Rupees 135/51) of Khairpur district is 25.5 per cent higher than the Sukkur district, which suggests better overall performance by the Khairpur date growers. This relatively superior performance of Khairpur district is likely to improve in future, due to faster increasing yields of and prices for the Asil variety in this district.

1. It was not the purpose of this study (being concerned with improving the performance of marketing) to dictate seller choice. Rather, the task is to suggest ways in which the results desired by sellers could be accomplished ie. higher returns with the same cost.

2- EFFICIENCY IN WHOLESALE SERCTOR

2.1 Labour Productivity

Table 3 shows that the Sukkur assembly market is more efficient than the two urban markets viz Hyderabad and Karachi. This reflects the relatively high quantity handled coupled with a lower number of employee. Average quantity per employee of the type "A" wholesale firms was 58.7 per cent higher than the average for the three markets.

In Hyderabad and Karachi it was lower at 59.7 and 81.6 per cent respectively.

Sales per employee and value added per employee in Sukkur market were 149 and 139 per cent respectively of the three markets average. In Hyderabad and Karachi markets these ratios were enhanced to some extent to 68 and 67 per cent and 83 and 94 per cent respectively. The somewhat smaller gap in performance between Sukkur and the other two urban markets using these two measures reflects differences in the selling prices (and possibly in the cost-price margins) and in the variety and forms of dates sold¹.

Similarly gross output per 100 rupees labour cost indicates the relative efficiency of Sukkur assembly market, which is 175 per cent of the average. In Hyderabad and Karachi, it remained 48 per cent and 77 per cent respectively. By comparing measures 1 and 4, it is evident that in measure 4, Sukkur assembly market is about 1.8 times the average, whereas, with measure 1 it is only 1.6 times which reflects the relatively low wage costs in Sukkur market. The same position seems to hold for type "B" wholesale firms who show even better relative efficiency at Sukkur market in comparison to Hyderabad and Karachi markets in all the efficiency measures employed.

The labour productivity of Karachi wholesale market was better than the Hyderabad wholesale market.

2.2 Economies of size

To evaluate the second aspect of wholesale efficiency, a cross-sectional method has been employed, which provides some indication of the size/cost relationship. Figure 1 shows that in type 'A' group firms, no firm was working in the lowest size category (ie. below 15,000 maunds) in these three markets. It is evident that the unit costs incurred by the largest group of firms (mostly working in Sukkur market) were significantly lower than the costs incurred by the firms working in the lower size groups (those working mostly in the other two markets o

1. Handling of higher value date variety and forms coupled with lower unit costs will provide higher margins and thus labour productivity measured in monetary terms will be enhanced.

Sind province). This analysis suggests a relationship between size and unit costs for both types of wholesale firms. It is not possible to reach definite conclusions based on this analysis about the significance of economies of size that, according to production theory, are practically always available. Nevertheless, these results demonstrate superior efficiency of type 'A' wholesale firms compared to type 'B' firms. The results also suggest that the costs seem to converge as the size of firm increases.

Bain (1968) has enumerated three possible relationships between a firm's size and its efficiency. In the situation described in this paper the largest firm size group has evidently¹ not become "big enough" to suffer perceptible diseconomies of large size. The reason would appear to be that the largest size group has not yet fully exploited all of available size economies. Therefore, it would be a "rational" interpretation of the data to conclude tentatively that firms in the largest size group are more efficient and that an "unknown" range of "optimum" size exists. The lower limit of this range would be at least the largest size group analysed here (i.e. 65,000 maunds and above). Caution is needed in interpreting these findings because many of these firms may not be working at the optimal point on their short run average cost curves due to underutilisation of capacity. However, the fact that a size/ efficiency relationship seems to exist is an inescapable conclusion from this analysis.

2.3 Capacity utilisation

In terms of efficiency it is desirable at wholesale level for firms to operate at least at the minimal optimal size. The extent to which firms are able to achieve this size of operation has a significant effect on production efficiency and therefore influences not only the unit cost of operation but the profit position as well. In evaluating this aspect of efficiency, 65,000 maunds, has been assumed to be the desired minimum efficient size (m.e.s.). The extent to which firms handled quantities below the m.e.s. level would provide some indication of the likely loss in production efficiency.

Figure 2 shows the extent to which type 'A' and 'B' wholesale firms were able to achieve their target during the date season (i.e. between July and September) and in the rest of the year during the 1983-84 season. It is apparent that, in Sukkur market, type 'A' and 'B' firms were both to operate close to m. e.s. during the date season, particularly type 'A' firms whose average throughput was about 94 percent of m.e.s. In all the three markets type 'A' firms were superior to type 'B'. However, in Karachi and Hyderabad in particular their average throughput was only 69 and 30 per cent of m.e.s. respectively, considerable below the Sukkur average. This analysis does not lead to definite conclusions ab

out losses in production efficiency as a result of small size firms. However, it does suggest that there were substantial inefficiencies at wholesale level, particularly in Hyderabad and Karachi markets. Utilisation of capacity remained very low during the off-season in all three markets.

3 EFFICIENCY IN RETAIL SECTOR

Table 4 shows the relative importance of the two measured components of efficiency at Sukkur, Hyderabad and Karachi retail markets.

The variable costs per maund at Sukkur retail market were 14.8 per cent higher than the average variable costs of the three markets. This may reflect market externalities caused by narrow and congested Sukkur market streets which would increase waiting and loading times of traders. The "effectiveness" of Sukkur retail market was better with regard to total fixed costs-reflecting lower wages and rent and rates in this market. However, the performance of retailers in Hyderabad and Karachi markets was superior with regard to unit variable costs.

CONCLUSIONS

(a) The fragmented structure of the date production sector seems to be associated with relatively inefficient resource use. If this structural position continues and no measures are taken to protect the crop against natural climatic factors, it is unlikely that production efficiency will improve significantly in the near future. Nothing was observed to suggest that means of realising size economies, such as co-operatives, were being utilised. It would be worthwhile to investigate the desirability and feasibility of such co-operative development measures both at grower level and for the processing and distribution stages.

(b) Evaluation of efficiency in the wholesale sector has revealed evidence of inefficient use of resources. In Hyderabad all the date throughput was marketed by firms of a size equivalent to less than 50 per cent of m.e.s., and in Karachi, the figure was 20 per cent. However, in Sukkur market, all wholesale firms were found to be operating at a size greater than half of the m.e.s., and only 20 per cent were operating below the m.e.s. This efficiency evaluation was confirmed by comparing labour productivity.

The present limitation on total date supplies and their highly seasonal nature are seen to be the major constraints on improving productivity. Moreover, non-rationalisation of capacity at wholesale level indicates inadequate competitive forces in the Sind date market.

(C) Efficiency in the highly fragmented and multiple product retail shops was not easy to measure. Although the evidence obtained at the three retail markets was inconclusive, it nevertheless demonstrates the effectiveness of Sukkur market with regard to total fixed costs and the superiority of Karachi retail market with regard to per maund variable costs.

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Table 1
Average efficiency of Khairpur district date orchards during 1983-84

Size of date-orchard (Acres)	AV. output in Mds	AV. revenue per Md (Rs)	AV. costs per Maund (Rupees)			AV. net income per Md (Rs)	Net Incom. AV. as % of gross revenue	
			AV. fixed production costs ¹	AV. variable costs	AV. total costs			
30-49	124.75	201.07	25/34	36/51	61/85	139/22	69.24	30.
50-69	116.18	193.31	27/13	35/23	62/36	130/95	67.74	32.
70 and >	116.78	184.71	25/82	31/05	56/87	127/84	69.21	30.
Average	121.11	196.83	25/88	35/44	61/32	135/51	68.85	31.

1. Fixed establishment costs are not included in the fixed production costs as most of the date orchards in Sukkur district are very old, and even in Khairpur district plantation periods vary greatly. As the total commercial life of a date palm extends to 52 years, it was difficult to compute the annual depreciation charges of each date orchard separately.

Table 2
Performance of Khairpur and Sukkur districts date orchards during 1983-84

District	Av. per acre output in Mds	Av. revenue per Md (Rs)	AV. COSTS per Maund (Rupees)			AV. net income per Md (Rs)	AV. Net income as % of gross revenue	AV. costs as % of AV. revenue
			AV. fixed prod. costs	AV. variable costs	AV. total costs			
Khairpur	121.11	196.83	25/88	35/44	61/32	135/51	68.85	31.15
Sukkur	109.94	149.85	10/68	31/20	41/88	107/97	72.05	27.95

Table 3
Productivity of labour employed at Sukkur, Hyderabad and Karachi wholesale markets,
1983-84

Efficiency measures	Sukkur		Hyderabad		Karachi		Average	
	A	B	A	B	A	B	A	B
1. Average quantity handled per employee (Maunds)	9524	8214	3583	2500	4900	3350	6002	4688
2. Sales per employee (Rs 000)	2920	2462	1333	859	1622	1060	1959	1460
3. Value added per employee ¹ (RS 000)	1302	1095	628	415	878	571	936	694
4. Output per 100 rupees labour costs (Maunds)	185	160	51	36	82	56	106	84

1. Sales less cost of dates purchased.

Table 4

Retailers average cost structures at Sukkur, Hyderabad and
Karachi markets, 1983-84

(Rupees)

Market	Total fixed costs	Av. variable costs (per maund)
Sukkur	22,200	23.90
Hyderabad	34,800	19.65
Karachi	46,680	18.90
Average	34,560	20.82

Figure 1.

Relationship of average unit cost to scale of firms size 1983-84

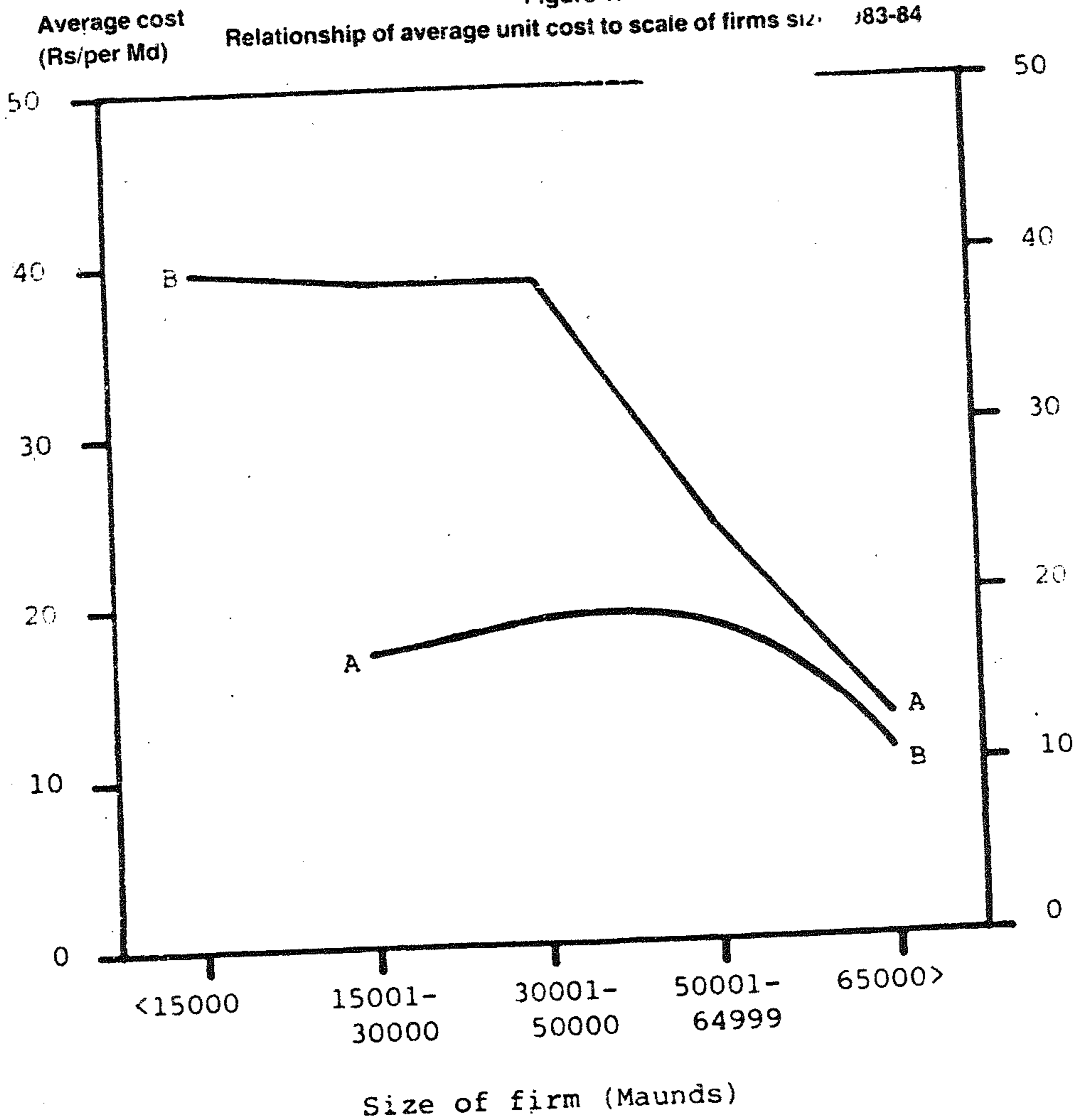


Figure 2. Average size of operation of Type A and B wholesale firms as a percentage of minimum efficient size during 1983/84

