

1991 (109)

ET

Faculteit der Economische Wetenschappen en Econometrie

05348

## Serie Research Memoranda

Middlemen's Role in Rural Industry.  
Case of Indonesia.

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Research Memorandum 1991-109  
december 1991

*vrije* Universiteit

*amsterdam*





# MIDDLEMEN'S ROLE IN RURAL INDUSTRY

## Case of Indonesia

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### SUMMARY

Contrary to the common belief that rural industry serves mainly local rural markets and that its growth depends on local agricultural development, cross-provincial analysis shows that small rural enterprises benefit more from improved transport facilities and urban development, and that the mediating role of middlemen is crucial in extending marketing services to the enterprises in small isolated villages.

#### 1. MIDDLEMEN ACKNOWLEDGED

Although it is generally known that in many developing countries rural workers combine farming and other primary activities with some manufacturing industry, it is still unclear under which circumstances such activities can develop into specialized rural industries (RI). Recent surveys report wide differences in RI structure and employment over countries and continents; employment can vary from 1 to 20 percent of rural active population in countries with similar income levels [Haggblade *et al.* 1989: 1176-9]. Some differences have been explained tentatively in terms of basic preconditions such as village size, industrial tradition, agricultural system, population density and transport facilities, but little is known about the specific operation of these variables or the economic agents they proxy [UNDP *et al.* 1988; Haggblade *et al.* 1989: 1183].

This paper aims to shed some light on this matter by analyzing the effects of distinct market environments and marketing agents on RI in 25 Indonesian provinces, where the distinct cultural and economic characteristics have led to diverse patterns of rural industrialization. It is argued that, in contradiction with the common assumption that RI depends primarily on local rural markets, RI rather depends on wider markets, and that lack of RI employment is mostly caused by isolation. Isolation should not be associated with economic distance only, but also with the absence of adequate intermediaries. The argument is presented in three sections. The first reviews demand and supply factors that have stimulated RI development and the function of intermediaries in this process, the second describes the regional variation of these factors, and the third presents a cross-section regression model of the main factors determining RI employment and earnings with middlemen services as a central variable.

## 2. RURAL INDUSTRY'S PROBLEMS AND MIDDLEMEN'S SOLUTIONS

A major problem for rural industry is its isolated location. Compared to their urban counterparts, village enterprises face almost unsurmountable barriers. In the survey of *Haggblade et al.*, a distinction was made between small villages and larger rural centres with more than 20,000 inhabitants [*Haggblade et al. 1989: 1182*]. Where the small villages had only some basic crafts and simple processing activities, the larger centres had more and increasing RI employment, which was concentrated in more sophisticated manufacturing activities such as metal working, furniture, textiles and footwear [*ibidem:1182-86*]. So it would seem that size of location is the only factor determining RI prospects. For one, larger centres would have the critical minimum scale of local demand required for full specialization in the manufacturing subsectors. In addition, larger places would have better transport facilities for export-oriented production, and they would offer other infrastructural services needed for more advanced manufacturing activities. The Indonesian industrial records, however, do not always corroborate this reasoning. In certain regions RI has developed in small villages without the support of a local market. This anomalous development pattern can be explained when we consider the economic functions of middlemen. Case studies and anthropological surveys [e.g. *Alexander and Alexander 1990*] show that Indonesia's populous rural regions are covered by various trade networks which link RI with distant markets. Such networks are typical for populous areas with ancient trade cultures, which can be found in many Asian countries. Although their historical function may have been to exchange farm products for urban goods, they presently also trade non-farm products and in addition pass essential technical information to the isolated villagers. Their technical and financial services include advances for labour and provision of materials and equipment for manufacturing. This trade network can be very wide and complex. Trade channels stretch far into the countryside, especially when they involve small traders with simple vehicles that can manage bad roads. At the lowest echelons many of these middlemen are in fact 'middlewomen'. The small middlemen may live in the neighbourhood of their clients and usually they are well acquainted, which enhances stable relationships and mutually benefitting transactions [*Knorringa and Weijland 1989*]. In this way, rural industries can develop even in small and distant villages as part of a local tradition of mutual dependence between traders, farmers and artisans.

Evidence of such symbiotic relationships in Indonesia has been taken from BPS surveys of rural cottage industry [*BPS 1989A-B*] and own field studies [*Spence and Weijland 1990, Sandee and Weijland 1989*]. The Indonesian definition of rural is rather narrow. The Central Bureau of Statistics (BPS) classifies locations as 'rural' if they score a low average for three characteristics: share of non-agricultural households, population density, and infrastructure facilities [*Rietveld 1988: 75*]. The greater part of the villages selected in this way have less than 20,000 inhabitants, and

therefore would belong to the category identified in Haggblade's survey as lacking RI potential. Nevertheless, in 1986 they comprised 66 percent of the manufacturing work force and 88 percent of Cottage Industry establishments in Indonesia, and population censuses/surveys of 1971, 1980 and 1985 showed that this rural work force has been growing up to the eighties [BPS 1987: 335, 338; 1989A: 30; World Bank 1985: 58-62]. It will be shown that RI in these small villages could not have stood its ground so well without strong links with wider markets. Nevertheless, most rural enterprises are so weak that they predominantly rank among the group currently classified as 'survival activities' which, according to theory, should decline with economic development [Anderson 1982; Haggblade et al. 1989: 1178-9; Farbman and Lessik 1989: 107; Weijland 1990b]. But RI in Indonesia does not seem to decline, and this may be largely due to its outward orientation. Our argumentation hinges on the assumption that RI in small villages could never rely on local markets as these were always too small for full specialization. The provincial data of Indonesia show that the sum total of traditional craftsmen such as blacksmiths, weavers, tailors, cobblers and carpenters can account for hardly more than one percent of the active population in the small villages unless they sell to wider markets [BPS 1989B:23]. So in order to safeguard continuity and improve productivity the small entrepreneurs increasingly oriented their production to wider markets wherever they were made accessible through traders and subcontracting middlemen. As a result, rural industry in Indonesia is currently outstripping its urban counterpart in selling abroad. Even small RCI shows a clear tendency to sell increasingly to wider markets, whereas urban CI shows the opposite tendency and on average sells more than 75 percent to local customers [Weijland 1990a: 19]. Only in the most isolated regions with prohibitive transportation cost does CI appear to be confined to its small local market.

Important factors favouring this outward orientation are high population density and good roads. Densely populated areas with dense road systems offer numerous transaction points, which encourages specialization [Haggblade et al. 1989: 1183]. By the same reasoning, proximity to cities appears to favour RI [Rietveld 1986]. So it was not surprising to find concentrations of RI in the densely populated provinces of Indonesia. Nevertheless, it also could be argued that good rural-urban transport facilities have detrimental effects on small village industries as local workers and customers would prefer to go working and shopping in the larger centres where wages are higher and commodities cheaper. This reasoning may be more valid for sparsely populated regions than for densely populated ones, as in the latter the improved transport facilities might help RI to overcome critical scale barriers, which would encourage rural integration through rural specialization. Indonesian RI statistics support the latter hypothesis. This leads to the question how the above critical scale barriers were in fact overcome by small and poor entrepreneurs such as living in the Indonesian countryside. On this problem industrial statistics are silent, but an apparent solution offers itself in the field as we find that some cottage industries tend to cluster in

groups of some 10 to 100 more or less independent workers. Compared to isolated enterprises, such clustered enterprises produce more for subcontractors or middlemen. They also hire each others' labour and equipment, subcontract work from each other, and sell each others' products. Such clusters can form an almost untractable, densely structured organization with frequent contacts and tight social control. Through co-operative organization, cluster members even may obtain capital, raw materials and services that otherwise would remain inaccessible. The 'collective efficiency' of clusters overcomes indivisibility problems and offsets many diseconomies of scale and so raises survival potential [*Best 1990: 105-8; Schmitz 1989*]. Clustering occurs not only within branches, it can extend to all kinds of complementary activities. Craft clustering may lead to specialization of entire villages [*Smyth 1990*]. As these specialized clusters offer a more varied choice in product quantity and quality, they even might offer more transaction potential for middlemen.

Apart from isolation, another typical problem of RI is seasonality, which is related to the fact that farm work usually pays better, but only as long as it lasts. Rural resource endowments are important in this context, for riches in land, minerals and forests tend to pull labour towards primary sectors, so that RI becomes only a secondary or even tertiary employment source. According to the Indonesian RI statistics, this is indeed the case in the islands with abundant natural resources - Irian Jaya, Kalimantan and Sumatra - where RI employment is low, and work days in RCI relatively few.<sup>1</sup> In that case the degree of specialization is also low. Having little skills and schooling, rural workers often function as the cheapest source of labour for manufacturing [*Oshima 1983; Haggblade et al. 1989: 1179*]. They tend to accept below-subsistence earnings between periods of primary employment, and can be hired easily by subcontracting middlemen to do simple piecework for large urban enterprises. This has been common practice in many densely populated rural areas in Asia, and according to recent surveys in Indonesia the number of rural workers engaged in some light export activity is increasing rapidly. This work is often done by poor women who have no better alternative [*Haggblade et al. 1989: 1177, 1179; Farbman and Lessik 1989: 108; UNDP 1988: 25*]. Indonesian RCI statistics corroborate that female participation is related to excessive poverty, as it varies from some 30 percent in the richest provinces to 60 percent in the poorest ones.<sup>2</sup> Rural women generally are less schooled than are men, and often not allowed to market their products by themselves and therefore not in a position to bargain. For middlemen who are looking for cheap labour such dependent persons are attractive

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<sup>1</sup> See Appendix, table 1, column 1, 19

<sup>2</sup> See Table 1 column 15

counterparts. On the other hand, these women may not be able to enter RI at all without using middlemen [Spence and Weijland 1990]. The function of middlemen therefore seems to be an ambiguous one: they would facilitate production and ensure additional employment, but take advantage of the most dependent and vulnerable labour sources. In the following sections it will be argued that this function may be even more complex if the middlemen with their technical and financial services are found to enable the poor to improve production and earnings.

### 3. RURAL INDUSTRY AND MIDDLEMEN IN THE PROVINCES

This section explores where RI came to existence, and under which circumstances middlemen have been involved. For this purpose, data of RI employment were taken from the population survey and industrial census.<sup>3</sup> These data allowed for a division of RI employment (RIE) into two size categories: Rural Cottage Industry Employment (RCIE) in enterprises with less than 5 workers<sup>4</sup>, and employment in the bigger enterprises (RLIE). In addition, two independent surveys on cottage industry gave information on labour, output, inputs, marketing and finance of CI. These data are presented in Table 1, page 13, together with basic economic statistics. To facilitate comparison, the provinces have been grouped into four regions<sup>5</sup>:

- 1) Densely Populated Centre provinces (DPC)
- 2) Settled Outer Island provinces (SOI)
- 3) Resource-Rich provinces (RR)
- 4) Isolated provinces (IP)

The grouping criteria correspond with the variables that have been found essential for RI development, namely industrial tradition, population density, transport facilities, agrarian system, and resource endowment [UNDP et al. 1988; Haggblade et al. 1989]. Industrial tradition is known to score high in DPC and SOI provinces, where it is proxied by the prevailing agrarian system that would favour RI (*sawah* culture, SAW). Population and road density score high only in DPC provinces, whereas natural resources are manifestly abundant only in RR provinces. Obviously, the DPC region scores highest with four out of five preconditions, the SOI provinces rank second with two, and RR provinces third with only one favourable condition. The remaining IP region, which consists of small isolated and mountainous island economies, lacks all five preconditions. So according to theory it would follow that RI employment as a percentage of rural active population

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<sup>3</sup> See data sources attached to Table 1

<sup>4</sup> Mainly unpaid family members

<sup>5</sup> The grouping is similar to the one offered in the leading economic study on economic diversity in Indonesia, 'Unity and Diversity' [Hill 1989]. Two provinces were excluded: DKI Jakarta because of its city characteristics, and East Timor because of data problems.

would be highest in the Centre and lowest in the Isolated Provinces. This reasoning is supported by the statistics, giving 10 percent RIE in DPC, 5.2 percent in SOI, 3.7 in RR, and 3.6 in IP provinces (column 1). But the between-group differences are rather small and the within-group differences large, so that it is evident that some variables are still missing. An important additional variable is rural poverty incidence. In the previous section it was argued that even under unfavourable marketing conditions high rural poverty incidence would push poor workers and especially poor women towards RI. It so happens that in the isolated provinces the rural people are very poor by any standard - whether regional product, farm income or poverty incidence - so that pressure for RI employment would be high there. This is indicated by the cottage industry (RCIE) component of RIE which is relatively high, while RLI is virtually non-existent. So it seems that in places where all favourable preconditions are lacking, RIE is driven by labour supply only. Even middlemen activities score low in this region. This situation stands in sharp contrast to that in the Centre, where excessive supply of labour is also evident, and RCIE is likewise dominant (65 percent of RIE), but where middlemen are very active. The latter are stimulated by the low transaction and transport cost associated with high rural population and road density (281 and 463 per km<sup>2</sup> respectively, against only 20 and 10 in IP provinces). They can also count on cheap labour in the Centre because of low farm productivity and high rural poverty incidence (respectively Rp 606,000 per year, column 5; and 32.6 percent, column 11). Moreover, they have a vast reservoir of dependent women workers with the lowest rate of literacy (36 percent, column 14). Not surprisingly, CI productivity in the Centre was lowest of all (Rp 332,000 per year, column 6). Nevertheless, demand pull factors are most favourable in this region, and with a good communication network and high urbanization rate (21 percent<sup>6</sup>) middlemen appear to abound in the Centre. They serve 40% of the CI enterprises, while only 27 percent of CI sells directly to local customers.

The Settled Outer Island (SOI) provinces present an interesting case. Here rural population density and road density is much lower than in the Centre, so one might expect less RI potential. Moreover, the SOI people are less poor. Their higher agricultural productivity would imply better alternative employment opportunities and consequently less supply of the lower RI labour categories. And indeed, compared to the Centre, RCIE is lower and less specialized, making less work days per month (column 19) and providing less primary incomes (*BPS 1989A: 48, 135*). But for those working in RCI, higher income standards allow for more purchased inputs per establishment, which contributes to higher RCI earnings. It is noteworthy that under these favourable circumstances RCI still tends to sell more to traders than to local customers.

Compared with SOI, Resource-Rich provinces with relatively high rural incomes offer even fewer

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<sup>6</sup> Excluding Jakarta



but more profitable opportunities for rural industry, which then is concentrated in larger enterprises. With very low road densities, middlemen fail to reach the interior and RCI has to orient itself more on its local market. But due to low population density, local markets are quite limited, so that RCI must remain relatively small. But it is rather prosperous compared to RCI in the other regions. As poverty incidence is low and middlemen are lacking, female participation in RCI is lacking too.

The Isolated provinces give a dismal picture. Although long distances hinder competition from large urban centres even more than in RRP, they also prohibit marketing to those centres. And as local markets are very limited in IP, marketing problems are even more severe. Middlemen cannot be very active here, so that direct selling in the poor local market remains predominant. RI employment tends to rise with increasing poverty, involving mostly illiterate women. In the wealthier IP regions the workers are predominantly male and literate, and their RI employment is mostly seasonal.

Comparing the circumstances of RI in the differently endowed provinces, it is clear that a large and diversified market such as in the Centre provinces makes an ideal seedbed for rural industry. Nevertheless, the very poor workers in that area must find it hard to keep up with market developments, as they are forever needing better and more materials and equipment. Table 1 (page 13) shows that the poorest workers can purchase hardly any inputs and therefore create correspondingly small added values (columns 6, 16). Only in regions with good and dense transport systems can middlemen networks take care of marketing and solve some financial problems. For instance, in rural Bali, where a booming tourist market encourages RIE, middlemen are marketing the products of almost half of the CI enterprises (column 17), and finance the working capital of 13 percent [BPS 1989B: 89].

The general picture that emerges is that in areas with even moderate transport and trade facilities, an ever increasing part of RI production is oriented to distant markets. This would lead to the conclusion that one of the essential conditions for employment creation in rural industry is to improve rural communication networks and encourage middlemen activities.

As for the subcategories, small RCI and larger RLI show diverging tendencies with rising prosperity. While RCI tends to decline at higher levels of rural development, RLI seems to prosper, benefitting particularly from improved access to wider markets and availability of resources.

#### 4. CROSS-PROVINCE REGRESSION ANALYSIS

Having offered some broad and impressionistic insights in the conditions for RI development, the hypotheses can be subjected to more rigorous statistical verification. For this purpose a model has

been constructed which has been tested step-wise using cross-section regression. Five sets of equations are to explain RI employment and productivity in a recursive model, with middlemen (MID) as a linking variable operating as a direct explanatory variable for employment and as an indirect explanatory variable for productivity. The other explanatory factors proxy demand and supply for RI products and labour.

The main purpose of the model is to demonstrate the role of middlemen, who are assumed to raise RI employment but affect average productivity as they engage mostly poor illiterate women in marginal activities. On the other hand, the financial and technical services of middlemen, expressed by increased input values (INP), are assumed to raise productivity in these marginal activities, which may offset the above negative productivity effect. Another use of the model is to show that economic development has similarly balancing effects on RI employment. On the one hand it would raise employment through increasing demand for RI products, but on the other hand it would create better job alternatives and pull labour away from RI, which would lead to increased RI productivity. The model then reads as follows:

$$\begin{aligned} \text{RIE, RCIE, RLIE} &= f(\text{GRP, ROAD, URB, RPOP, AGP, RPR, MID}) & (1) \\ \text{RCIP} &= f(\text{AGP, RPR, FEM, INP}) & (2) \\ \text{INP} &= f(\text{POV, MID}) & (3) \\ \text{FEM} &= f(\text{POV, MID, SAW}) & (4) \\ \text{MID} &= f(\text{GRP, URB, RPOP, AGP, SAW}) & (5) \end{aligned}$$

The equations explain:

- (1) Three types of employment: RIE, RCIE and RLIE, in 1985/86;
- (2) Value added per working hour in Cottage Industry, RCIP, in 1986 and 1987,
- (3) Purchases of inputs, INP, in 1986 and 1987
- (4) Female participation, FEM, in 1986<sup>7</sup>
- (5) The extent middlemen services are used, MID, in 1986 and 1987

The explanatory variables are:<sup>8</sup>

Regional productivity, GRP  
 Road density, ROAD, or ROAD\* (when in excess of RPOP),<sup>9</sup>  
 Degree of urbanization, URB,  
 Rural population density, RPOP,  
 Agricultural productivity, AGP,

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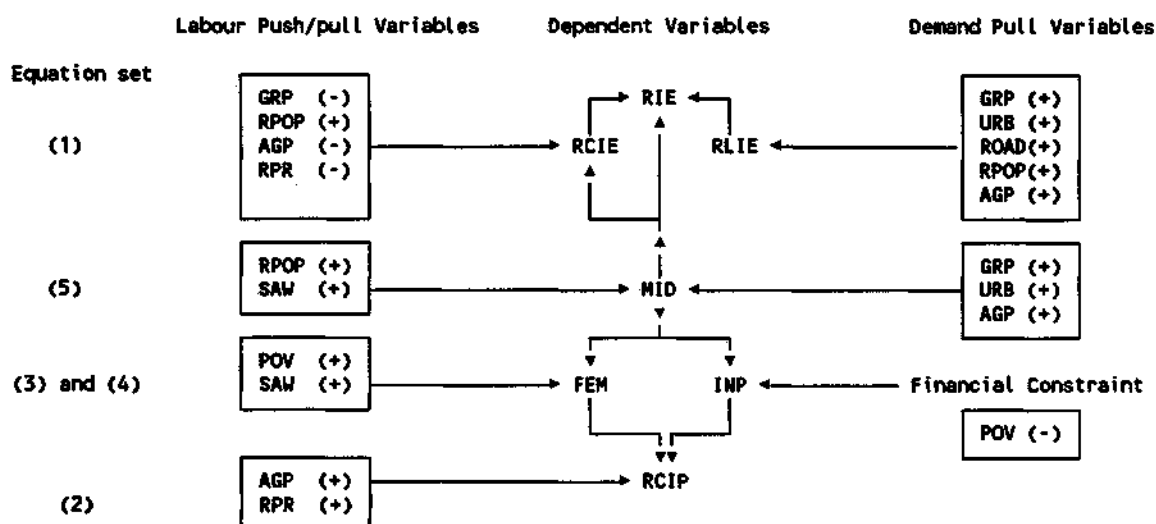
<sup>7</sup> The BPS publication on the Cottage industry Survey of 1987 did not give data on female participation

<sup>8</sup> For precise definitions and data sources see page 14

<sup>9</sup> Rural population density (RPOP) and road density (ROAD) are strongly correlated ( $r = 0.80$ ). An independent road density variable (ROAD\*) was constructed, deducting normalized RPOP from normalized ROAD.

Local rural rice price <sup>10</sup>, RPR,  
 Rural poverty incidence, POV,  
 Tradition in rural crafts and trade in settled provinces, proxied by SAW  
 Use of middlemen services, MID,  
 Female participation, FEM,  
 Expenditures on intermediate goods INP.

A scheme of the five sets of equations with their regression results is presented in Table 2, page 15. The structure of the model is presented below.



In the first set of equations (RIE, RCIE and RLIE), the various categories of employment are related to demand and supply variables. Demand for RI products is assumed to depend on regional and agricultural productivity and urbanization (RGP, AGP, URB). Apart from MID services, markets are assumed to widen with rural population density and rural road density (RPOP, ROAD). Excessive supply of labour for cottage industry is related to low AGP and RPR, representing inadequate alternative earnings in farming, proxied by low agricultural productivity (AGP) and low rural rice prices (RPR).

In the second set, RCI productivity (RCIP) is also related to AGP and RPR, but high values of these two variables now proxy high opportunity cost of labour, withdrawal of marginal labour, and a wage cost push. Female participation (FEM) and expenditures on intermediate inputs (INP) are

<sup>10</sup> Relatively low productivity and low rice prices would mean overcrowding and low wages in agriculture.

added to qualify labour<sup>11</sup>, technology, and the access to materials and equipment. These should have balancing effects on productivity: on the one hand, high female participation would depress RCIP, but on the other hand higher values for inputs would raise RCIP.

INP and FEM are explained in set 3 and 4. Both are assumed to be affected by poverty, but obviously with opposite signs: INP would be depressed by poverty due to lacking financial means, while FEM would grow. But both would be raised by middlemen activities (MID). In addition FEM is assumed to depend on cultural factors such as prevailing in the settled provinces, which were proxied by SAW. Finally, MID itself is explained in the fifth set of equations, and related to urban and rural demand and access variables (GRP, AGP, URB, ROAD, RPOP) and a given trade tradition, again proxied by SAW.

The raw data of the variables are presented in Table 1, page 13. For cross-provincial analysis, nominal money values were corrected for price differences, and employment estimates were corrected for working time differences (WDM). Then the data were normalized so that the obtained regression coefficients express the explanatory weights of each variable. For CI analysis two surveys were available for 1986 and 1987, providing independently estimated data sets. The regression results of the 1986 data were checked against the 1987 results to verify the robustness and demonstrate the stability of certain observed tendencies.

The regression results are presented in Table 2, page 15. The results for employment are rather satisfactory and interesting. For one, they indicate that the demand pull variables GRP and AGP can indeed turn into labour supply push variables in the two size categories of RI. Thus GRP and AGP have contrary employment effects on small traditional RCI as opposed to larger RLI. This would imply that the product demand pull of economic development dominates in RLI employment, while the labour supply push/pull effect (alternative employment opportunity) dominates in RCIE. Putting these findings in a time perspective they suggest that the weight of the larger and more profitable enterprises would tend to increase with economic development, while the weight of RCIE would fall. This is an altogether plausible and welcome result which is backed by other studies [Anderson 1982]. As can be read from the third employment equation, this shift towards RLI employment stems mainly from demand factors such as urbanization, improved communication, and agricultural development. RCI employment, on the other hand, depends more on supply variables such as population density and low farm prices. Turning now to middlemen (MID), it can be seen that their services score high in the independent employment estimates for RIE and RCIE. It is remarkable that MID is even more significant for RIE than for RCIE, which

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<sup>11</sup> Prior research revealed that FEM correlates with illiteracy but is the stronger variable in the model.

could mean that even larger enterprises depend to a certain extent on MID. According to the fifth set of equations, MID services depend on given population density RPOP and tradition SAW, but also on urbanization and agricultural development, or, taking the 1987 estimate, on aggregate regional growth GRP (which almost implies the same<sup>12</sup>). This is an interesting result as it points at a trickle down process of development through marketing intermediaries.

A similar tendency is estimated for RCI productivity (RCIP), which is shown in the second set. The regression results indicate that the positive effects of AGP, RPR, and INP can hardly offset the negative effect of FEM. But according to the results of set 3 and 4, both FEM and INP are positively related to MID, so that the latter indeed might exert the ambiguous role it was assumed to, but the results are not so significant. It is more certain that high poverty incidence (POV) is a major determinant of low values of inputs and high female participation. These in turn should depress productivity and earnings in RCI and thus cause a vicious circle.

The above inferences are more reliable when confirmed by the regressions of both data sets. Unfortunately this is not always the case. Sometimes recourse had to be taken to slightly different specifications expressing similar tendencies. So the proof of the hypothesis that middlemen would raise productivity through their input services remains rather weak as it can be demonstrated only with the 1987 data set, and then without much significance. On the other hand, the hypothesis that middlemen stimulate RI employment cannot be rejected so easily, as it is confirmed significantly by the two independent data sets for RIE and RCIE. The high adjusted R squared for the employment and productivity regressions give an indication that the model specifications for these variables are rather complete. For the other variables the specifications are weaker. So it would be incautious to draw strong conclusions from the obtained results for the effects of middlemen on female participation and inputs. The only robust variable which is significantly determining FEM and INP is rural poverty, POV.

## 5. CONCLUSIONS

Rural industry in Indonesia has been shown to depend significantly on urban markets and middlemen who help to make these markets accessible. The degree of urban market orientation appears to vary with the the level of economic development and the degree of urbanization. The provincial data suggest that the prospects for RI development are very limited in isolated regions with few natural resources and small local markets. In such places rural industry is a poverty-driven activity bound to decline when other sources of income are offered. In regions with relatively

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<sup>12</sup> In regression analysis the variance of GRP can be explained for more than 95% by urbanization and agricultural productivity.

abundant resources a typically resource-based industry can be made to thrive if access to distant markets can be gained and communication channels improved. Rural areas with good trade networks are likely the most favourable seedbeds for rural industry of all sizes.

The results of the study suggest that only the larger enterprises would benefit directly from the development of urban and rural markets, whereas employment and income in cottage industry would be related indirectly to economic growth, depending primarily on intermediaries for the financing of their inputs and the marketing of their outputs. This would imply that for the larger enterprises demand oriented policies of a macro nature might suffice, while the very small ones would need additional measures to remedy their weak financial position and poor access to markets. In addition to these already orthodox policies of a macro and micro nature, regional policies involving subcontracting producers and middlemen might deserve consideration. Although the results of the cross-provincial analysis are not always significant, they are sufficiently positive to recommend further investigation in this direction.

Table 1. RURAL INDUSTRY AND ECONOMIC ENVIRONMENT, 1985-87

Province	RIE Employment			Productivity			Density			Rural Economy			Cottage Industry						
	RIE '85	RCIE '86	RLIE 85/86	GRP '86	AGP '86	RCIP '87	RPOP '85	ROAD '86	URB '85	ACT '85	POV '80	RPR '87	SAW '86	LIT '87	FEM '86	IMP '87	MID '87	DIR '87	MDM '87
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
<b>Densely Populated Centre</b>	10.0	6.5	3.5	1180	606	332	281	463	21	5835	32.6	362	38.4	36	48	1329	40	27	48
Yogyakarta	11.5	9.7	1.8	846	460	214	482	684	22	1111	30.7	363	22.1	27	59	834	37	31	47
Central Java	10.6	8.3	2.3	963	632	273	300	376	18	8609	39.0	361	45.7	32	48	1095	44	22	49
East Java	7.6	4.1	3.5	1206	625	300	251	354	19	10699	42.7	350	45.8	35	46	1437	29	36	50
West Java	8.0	5.0	3.0	1432	709	365	182	243	34	7769	26.3	368	50.0	43	36	1666	47	25	48
Bali	12.1	5.3	6.8	1453	(1257)	512	189	660	14	989	24.2	369	28.2	43	50	1611	41	22	47
<b>Settled Outer Island Provinces</b>	5.2	4.0	1.2	1353	735	508	29	125	19	1378	14.0	399	31.2	56	42	1888	36	29	42
Lampung	3.2	3.1	0.1	865	545	367	53	136	13	1673	40.1	379	17.6	48	33	1473	22	51	47
North Sulawesi	7.0	4.5	2.5	1110	613	688	37	191	16	665	19.7	418	8.1	67	38	1036	32	26	35
South Kalimantan	6.2	6.0	0.2	1302	604	658	21	87	21	781	2.7	392	52.0	41	58	3089	52	13	43
South Sulawesi	8.6	6.4	2.2	1309	950	391	23	136	18	1656	17.4	311	41.0	46	47	1817	35	27	39
West Sumatra	4.1	4.6	-	1528	804	553	22	124	13	1077	10.4	445	41.3	62	39	2610	47	25	44
North Sumatra	3.5	1.5	2.0	1606	880	389	34	144	26	2346	6.3	445	33.3	66	41	1482	25	26	42
South Sumatra	4.1	2.1	2.0	1751	751	511	14	59	27	1450	1.1	402	24.8	63	40	1707	37	37	45
<b>Resource-rich Provinces</b>	3.7	2.3	1.4	1694	944	610	9	45	18	519	5.9	421	18.6	52	27	1508	25	42	37
Bengkulu	1.4	2.8	-	1202	770	635	15	106	10	306	4.8	435	24.3	62	25	848	19	58	37
West Kalimantan	3.8	2.1	1.7	1294	534	652	6	14	17	853	4.4	412	16.3	29	21	2030	26	38	32
Irian Jaya	1.3	0.7	0.6	1337	676	644	1	5	21	402	5.0	449	3.7	39	22	1055	14	63	37
Jambi	4.3	2.1	2.1	1379	817	647	10	80	13	445	0.3	414	19.5	61	27	2203	14	51	40
Central Kalimantan	4.0	2.4	1.6	1663	741	501	3	8	10	397	0.4	424	19.5	62	15	1760	28	32	42
Riau	3.7	3.2	0.5	1870	824	554	6	40	22	574	28.4	429	9.3	51	28	1193	21	33	37
Aceh	3.7	3.4	0.3	1935	1288	588	17	96	9	896	1.8	418	35.3	50	45	2189	35	24	40
East Kalimantan	7.5	2.0	5.5	2872	1902	660	17	7	40	280	1.8	390	21.1	60	30	2061	44	38	32
<b>Isolated Provinces</b>	3.6	4.5	-	964	598	401	20	97	10	689	29.1	372	18.1	48	35	900	22	57	33
East Nusa Tenggara	5.3	3.2	2.1	584	375	214	26	133	8	1187	54.1	384	10.4	41	60	441	14	69	27
West Nusa Tenggara	6.7	7.6	-	716	592	272	47	141	14	932	38.4	369	52.8	21	51	655	24	48	43
Central Sulawesi	4.4	4.1	0.3	993	549	452	7	60	9	512	15.6	378	14.3	59	19	1008	24	56	31
South-East Sulawesi	3.6	4.9	-	995	576	483	14	122	9	385	23.0	313	12.9	55	15	933	15	68	35
Maluku	3.5	2.9	0.6	1535	900	586	6	29	11	431	14.8	417	0.2	63	29	1464	31	46	34
<b>Indonesia</b>	7.4	5.0	2.4	1350	775	484	71	71	18	1857	18.1	393	25.9	61	47	1567	37	30	40

For notation and data sources see next page

## VARIABLES AND DATA SOURCES

1. RIE Rural employment in Manufacturing as percentage of rural active population (Supas 1985)  
BPS 1987: 333-38.
2. RCIE Rural cottage industry employment (1986) as percentage of rural active population (1985).  
BPS 1989A: 48; 1987:333
3. RLIE Rural Manufacturing employment in establishments larger than cottages  
RIEE minus RCIE
4. GRP Gross product (excl.oil) per worker by province, 1986 (000Rp).  
BPS 1989E: 90-124; BPS 1987: 338
5. AGP Agricultural product per worker, 1986 (000Rp)  
BPS 1989E: 90-124; BPS 1987: 338
6. RCIP Cottage industry value added per worker, 1986 and 1987 (000Rp)  
BPS 1989A: 149, 111; BPS 1989B: 134
7. RPOP Rural population density  
Computed from population census statistics 1985 excluding townships
8. ROAD Road density 1986 (m/km<sup>2</sup>),  
BPS 1989D: 5, 424-27
- 8\* ROAD Road density in excess of population density  
normalized ROAD minus normalized RPOP
9. URB Urban population as percentage of total, 1985  
BPS 1987
10. ACT Rural active population 1985 (000)  
BPS 1987: 335
11. POV Rural poverty incidence 1980, percentages  
Hill 1989: 42-43
12. RPR Rural rice price 1987 (Rp p.kg)  
SUSENAS survey 1987, in World Bank 1990: 159
13. SAW Wetland area as percentage of cultivated land, 1986  
BPS 1989D: 210-11
14. LIT Literacy rate of RCIE workers  
BPS 1989B:29
15. FEM Female participation in rural cottage industry, 1986  
BPS 1989A: 108
16. INP Intermediate inputs per cottage establishment per year, 1986 and 1987 (000Rp)  
BPS 1989A: 148; BPS 1989B: 146
17. MID Percentage of CI units using middlemen services for marketing, 1986 and 1987  
BPS 1989A:102; BPS 1989B: 110
18. DIR Percentage of output sold directly to consumer  
BPS 1989B: 113
19. WOM Full workdays a month, per CI establishment 1987  
BPS 1989B: 80



Table 2. EQUATIONS AND REGRESSION ANALYSIS RESULTS

Dependent Variables	Explanatory Variables											$\frac{2}{R}$
	GRP	ROAD	URB	RPOP	AGP	RPR	POV	SAW	MID	FEM	INP	
<b>1. Employment</b>												
R1E1985	ins	+0.2587 (2.92)	ins	+0.5700 (5.54)	ins	-0.3049 (-3.23)			+0.3507 (3.83)			0.82
RC1E1986	-0.3791 (-2.87)	ins	ins	+0.3550 (2.73)	ins	-0.3149 (-2.57)			+0.4303 (3.16)			0.72
RL1E	ins	+0.3538 (2.48)	+0.3673 (2.53)	ins	+0.3919 (2.65)	ins			ins			0.53
<b>2. Productivity</b>												
RC1P1986					+0.2738 (2.15)	+0.3309 (2.92)			-0.5434 (-4.35)	+0.2522 (1.87)		0.75
RC1P1987					+0.1521 (1.85)	+0.3817 (2.63)			-0.3559 (-2.70)	+0.4730 (3.26)		0.66
<b>3. Inputs</b>												
INP1986							-0.6053 (-3.53)		ins			0.34
INP1987							-0.6885 (-4.93)		+0.2901 (2.08)			0.54
<b>4. Female partic.</b>												
FEM1986							+0.4692 (3.05)	+0.2851 (1.51)	+0.3374 (1.78)			0.47
<b>5. Middlemen</b>												
MID1986	ins		+0.2610 (1.74)	+0.1510 (0.99)	+0.3357 (2.21)			+0.3805 (2.40)				0.51
MID1987	+0.3843 (2.42)		ins	+0.4377 (2.67)	ins			+0.2899 (1.76)				0.45

All variables were normalized. t statistics in parenthesis. Ins denotes statistical insignificance.

## REFERENCES

- Alexander, Jennifer, and Paul Alexander 1990, *The Cultural Construction of Information in Javanese Markets*, Discussion paper, CASA, Amsterdam
- Anderson, D. 1982, Small Industry in Developing Countries: a Discussion of Issues. *World Development* 10/11: 913-48
- Best, M.H. 1990, *The New Competition*, Cambridge UK, Polity Press
- BPS (Biro Pusat Statistik, Jakarta)  
1985, *Susenas 1982: Report on Cottage Industry*  
1987, *Supas 1985*  
1987A, *Analisa Pendahuluan Hasil Sensus Ekonomi 1986*  
1987B, *Analisa Perbandingan Industry Besar/Sedang, Kecil dan Rumah tangga*  
1987C, *Economic Census 1986, Results of Establishment Listing*  
1989A, *Home Industry Statistics, 1986*  
1989B, *Home Industry Statistics, 1987*  
1989C, *Expenditure for Consumption of Indonesian Population by Province 1987*  
1989D, *Statistik Indonesia 1988*  
1989E, *Provincial Income in Indonesia, 1983-1986*
- Farbman, Michael and Alan Lessik 1989, The Impact of Classification on Policy.  
In: Antoinette Gosses et al. eds, *Small Enterprises, New Approaches*. The Hague, Ministry of Foreign Affairs.
- Haggblade, S., P. Hazel and J. Brown 1989, Farm-Nonfarm Linkages in Rural Sub-Saharan Africa. *World Development*. Vol. 17 No 8, pp. 1173-1201
- Hill, H. (ed) 1989, *Unity and Diversity: Regional Economic Development in Indonesia since 1970*. Singapore, Oxford UP.
- Knorringa, P. and H. Weijland 1989, *Subcontracting, or the Incorporation of Small Producers in Large Networks*. in: I.S.A. Baud (ed.) *Women, Small Scale Industry and Development* London, Sage, forthcoming
- Oshima, H.T. 1983, *The Transition to an Industrial Economy in Monsoon Asia*. Manila, Asian Development Bank, Staff Paper 21
- Rietveld, P. 1986, *Non-Agricultural Activities and Income distribution in Rural Java* Amsterdam, Free University, mimeo
- Rietveld, P. 1988, Urbanisation and Urban Development Patterns in Indonesia. *Bulletin of Indonesian Economic Studies*. Vol. 24 No 1
- Sandee, H. and H. Weijland 1989, Rural Cottage Industry in Transition: Roof Tiles Industry in the Regency Boyolali. *Bulletin of Indonesian Economic Studies*, Aug. 1989
- Schmitz, H. 1989, *Flexible Specialization - a New Paradigm of Small-Scale Industrialization?* Discussion Paper 261, Institute of Development Studies.
- Smyth, Ines 1990, *The Rattan Industry of Tegalwangi: A Success Story for Small Scale Enterprises?* Discussion Paper, Institute of Social Studies, The Hague
- Spence, N. and H. Weijland 1990, *Evaluation of Pilot Project of the Productive Role of Rural Women*. Jakarta, UNDP

UNDP, DGIS, ILO and UNIDO 1988, *Development of Rural Small Industrial Enterprises*.  
Vienna, UNIDO

Weijland, H.

1990a, *Cottage Industry in the Indonesian Provinces*. Amsterdam, Free University,  
Research Memorandum 1990-90

1990b, *Target Groups for Industrial Policy. The Case of Rural Indonesia*. Amsterdam,  
Free University, Research Memorandum 1990-89

World Bank

1985, *Indonesia, Wages and Employment*. Washington DC

1990, *Indonesia, Poverty Assessment and Strategy Report*. Washington DC

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