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Intersectoral Resource Transfers

Some Further Remarks

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Mody's 'Reply to a Reply' (Mody 1980) confirms my earlier view that at least some of our apparent 'differences' are really nothing more than confusions arising out of asking different questions rather than offering different answers to the same question. Accordingly in addition to my responses to the specific issues he has raised, I have also presented here what I hope is an objective account of those issues on which we may now agree and those on which we must perhaps agree to disagree.

1. Two Concepts of Resource Flow: In my original reply (Mundle 1980) to his critique (Mody 1979) I had pointed out that the aggregate income-expenditure accounting framework presented by Mody was not the same as the inter-sectoral balance of trade account in terms which I had actually defined and measured the intersectoral flow of resources. Mody has taken this to mean that I failed to see "the obvious equivalence between the two" even though I had myself drawn attention to the correspondence between these two ways of presenting the accounts. That I nevertheless found it necessary to point out that his manner of presenting the accounts was different from mine was precisely due to the fact that his alternative presentation reflected a preoccupation with a different question which led

him to an erroneous interpretation of my exercise and the question that I was concerned with<sup>1/</sup>.

We can explain this more clearly in terms of the basic balance of payments identity.

$$R = V+K$$

where R is the balance of trade between the two sectors, V the net transfer on current account including rent, interest, etc. and K the net flow on capital account or the net savings flow. I defined the intersectoral flow of resources as the balance of trade and accordingly proceeded to measure the net flow of commodities between the two sectors. Clearly there is no conceptual inconsistency here between the definition and the measurement (other than problems arising out of the limitations of data which we are not concerned with at this point) irrespective of what values V and K happen to take on the right hand side of the identity. My empirical exercise was entirely concerned with only the left hand side of the identity, i.e. the balance of trade. The elements V and K entered the picture only in so far as my estimate of R was by definition also a measure of the sum of V+K on the right hand side

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<sup>1/</sup> I should add that it was especially important to point this out in view of the fact Modi had published his critique of a work which was itself in the main unpublished. As such most readers would be unaware of how I had in fact proceeded in my exercise or the inaccuracies in Mody's description of it. By my exercise I mean here my unpublished doctoral dissertation (Mundle 1977a) and a related paper (Mundle 1975) to which Mody's earlier critique was addressed. Fortunately the main body of this work will now be available in the volume "Surplus Flows and Growth Imbalances:" published by Allied Publishers, New Delhi.

of the identity. In fact it is not possible to say anything at all from my estimates about the individual values of  $V$  and  $K$  whether they are zero, positive or negative.

Mody, on the other hand, appears to have been primarily interested not in  $R$  but in the net savings flow  $K$  on the right hand side of the identity.<sup>2/</sup> And in keeping with his perspective he has viewed the variable  $R$  not as itself constituting the resource flow, as I do, but rather as a surrogate for the net savings flow  $K$ . It is easy to see that from this point of view the use of  $R$  would be quite unsatisfactory since it would give us a correct measure of the net savings flow only in the special case where  $V=0$ . In all other cases it would either over estimate or under estimate  $K$  depending on whether  $V$  is positive or negative. His own view notwithstanding, Mody would probably recognise that not all of us would like to treat, for instance, the income of absentee land owners or money lenders as being compensation for services rendered. I personally would certainly regard such 'factor income payments' as being a pure drain from the value added in agriculture just as much as a net savings outflow from agriculture. In the same vein

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<sup>2/</sup> It should be noted that Mody's own unpublished research on resource flows, which he had cited in his original critique (Mody 1979) is indeed an attempt to get point estimates of  $K$ . This perspective is also reflected in his Reply (Mody 1980) where he states:

"If there are no factor income payments, the balance of trade measures only the effective savings transfer. This is a resource transfer without a quid pro quo and there is no problem with it. However, a net factor income outflow represents a net inflow of factor services and vice versa a net factor income inflow has a counterpart in a net outflow of factor services. Thus factor income payments are not unrequitted transfers. At the conceptual level, it is therefore not correct to include, as the balance of trade approach implicitly does, factor income payments in a measure of resource flow" (Mody 1980 pp 2.3).

I think Mody would now accept that while the concept of resource flow in his sense, i.e. a net savings transfer, may be appropriate for some purposes; the alternative concept of resource flows in the sense of the net flow of actual goods and services measured in value terms would be equally useful for other analytical purposes.<sup>3/</sup>

2. Treatment of Indirect Taxes: The second point of dispute at the conceptual level relates to the treatment of indirect taxes. Mody has now dropped the earlier claim that my balance of trade approach "does not account for indirect taxation" (Mody 1979 p.62) However he has now raised an objection about the particular manner in which I have treated it. The problem arises once again, I think, from a failure to clearly distinguish between the different questions we are asking. My problem, in measuring resource transfers in the sense defined above, was to compute the actual balance of receipts over payments by agriculture on account of commodity trade vis-a-vis the non-agricultural sector. Since indirect taxes on the commodities imported by agriculture is a net addition to the import bill payable by agriculture (government being a part of non-agricultural in my demarcation of sectors) the valuation of imports has to be gross of these taxes. On the other hand indirect taxes paid on agricultural commodity exports do not accrue to that sector but remain as internal payments within non-agriculture. As such they ought not to be added

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3/ This is the impression I get from some of his very recent work e.g. "Interpretation of the Balance of Trade Account and the Terms of Trade Movements (unpublished manuscript)

on in the valuation of agriculture's export earnings. This was the principle I tried to follow in my empirical estimates.<sup>4/</sup> It will be evident that exactly the same reasoning could apply in the case of trade and transport margin, these activities being also included under non-agriculture.

Mody's objection to this is that unlike trade and transport margins, indirect taxes are not a payment for services. They are instead, like direct taxes, a pure draft by the government.<sup>5/</sup> Consequently, incorporating them in the valuation of imports amounts to a distortion. Though he does not put it in these terms, Mody seems to have in mind here some notion of the true or inherent value of the commodities imported, presumably corresponding to their physical mass, etc. For, he goes on to illustrate the anomaly arising out of incorporating indirect taxes in import valuation by citing the case of a given physical volume of imports appearing as a larger volume of resource inflows in value terms

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4/ In this I was only partially successful since the nature of the data did not permit the elimination of indirect taxes or distribution margins in the case of consumer goods. This however is a data problem not a conceptual one and it is discussed further below.

5/ By treating indirect taxes as being analogous to distribution margins in the sense discussed above I seem to have conveyed the impression that we must regard indirect taxes as a payment for government services. This is not the case. We may assume, as Mody does, that indirect taxes are a pure draft just like direct taxes. But it does not follow therefore that indirect taxes cannot enter into the formation of commodity prices. They may form a part of price, depending on whether we are concerned with producer's price or purchase price, and in this sense they are similar to distribution margins so far as computing the commodity balance of trade is concerned.

simply by virtue of a rise in indirect tax rates.

If this is indeed the burden of Modi's argument here, I would entirely agree with him, with the remark that we would run into exactly the same problem with a rise in the mark-up or distribution margins or any other disturbance that would raise the price of imports, its volume and everything else remaining the same. Why pick on indirect taxes alone? It will be immediately obvious ofcourse that the kind of objection raised here applies not only to our limited problem of resource flow measurement but to valuation is general. As I had indicated in my earlier note (Mundle 1980 p.10-12) the choice of an appropriate price system or, properly speaking, on appropriate weighting system for valuation remains one of the most intractable problems in much of our economic measurement. My own exercise however was pitched at the relatively mundane level of simply calculating the balance between agriculture's actual receipts and actual payments on the commodity trade account vis-a-vis non-agriculture.

This difference in perspective notwithstanding, it bears pointing out that if for the sake of argument we grant that Modi's objection is justified, then the principle empirical implication of this would be that by virtue of having included indirect taxes in the valuation of agriculture's imports I have actually underestimated the net outflow of resources from agriculture. This runs counter to the main thrust of his criticism at the empirical level where he attempts to prove that I have over estimated the net resource outflow.

3. Validity of NSS based Consumer Goods Flow estimates: At the empirical level Mody's first criticism is the claim that there is an estimation bias in my NSS based estimates of inter sectoral consumer goods flows. He further claims that if these 'biases' were eliminated then this "could well change Mundle's alleged outflow of resources from agriculture into an inflow" (Mody 1980, p.4) Mody had made a similar criticism in his earlier critique (Mody 1979). At the time I had tried to meet him half way and conceded this partly because Mody was reflecting an existing body of opinion in the literature, represented among others by Dandekar & Rath (1971), but mainly because I went on to argue that in my judgement even if it existed the bias could only be marginal and therefore would not have seriously distorted my estimates.<sup>6/</sup> Since Mody has subsequently expressed skepticism for my judgement and attempted to prove that my use of NSS data has introduced a major element of bias in my estimates I would now take him up on this and question whether the claim of a bias in my NSS based estimates is at all sustainable.

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6/ The reasoning was the following. The villain of the piece is alleged to be the under representation of the rich. However the rich form only a fraction of all consumers and the relevant items here-especially food grains and durables - is again a part of their total expenditure. Finally the under representation itself would amount to not the whole but a part of their consumption of these items. As such in relation to the magnitudes involved we have here an error belonging to the third order of smalls and therefore negligible. Notice that the argument here is set out in terms of proportions e.g. a, b and c where a, b & c are all less than one such that the factor (a.b.c) would give us a very small fraction of whichever aggregate it is applied to. As such the reasoning would apply as much for the aggregate of total consumption expenditure as for the aggregate of only the traded consumption goods between agriculture and non-agriculture.



claim of a bias in my NSS based estimates is at all sustainable.

Mody's argument here is based on two propositions. First that my estimates of intersectoral consumer goods flow are highly sensitive to biases, however small, in the NSS expenditure level estimates and second that the bias itself is actually quite large in foodgrains etc. So large in fact that they "could well result in an over estimate of per capita foodgrains exported from agriculture by a margin of 20-30 percent"! (emphasis added). I shall demonstrate that both these propositions are based on somewhat dubious reasoning such that the criticism itself is not easily sustainable - let alone the huge magnitude of 'over estimation' which Mody has discovered.

To make his point that my estimate of intersectoral consumer goods flows are highly sensitive to even small estimation biases in the NSS data what Mody in fact does is to cite my own comparison between a preliminary time series of consumer goods flows which I had constructed in 1975 (Mundle 1975) and the revised time series which I constructed in 1977 (Mundle 1977a). One of the main difference between the two estimates was that some commodities like pan, supari and firewood, which had been erroneously classified as non-agricultural items in the earlier estimate were reclassified under agriculture in the later estimate. As it turned out the two estimates were substantially different in most years and I had made the comparison simply to demonstrate that the estimates were quite sensitive to my commodity classification. Now to show that the estimates are sensitive to my commodity classification is not at

all the same thing as showing that the estimates are sensitive to biases in the NSS expenditure levels. It is difficult to see how, or why, Mody drew this latter inference from my comparison.<sup>7/</sup> In fact in order to test the sensitivity of the estimates to the so called 'biases' in the NSS expenditure levels the obvious thing to do would be to directly apply the appropriate correction factors to the data and calculate the difference. Ofcourse in actual practice the question of doing this does not arise since neither the existence of bias in NSS data nor its magnitude has ever been established.

This brings me to Mody's second proposition here that the NSS estimates are biased, particularly in the case of foodgrains, leading to an over estimate of agriculture's exports to non-agriculture and hence an over estimate of the net resource outflow as well. While using the NSS consumption expenditure data to estimate changes in real per capita consumption for different fractile groups over time Dandekar & Rath (1971) found that the poorer sections had fared better than the rich. Considering this to be absurd, Dandekar and

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<sup>7/</sup> It is also noted parenthetically that Modi, having placed the two estimates together as alternatives (Mody 1980 tables 1 & 2), proceeds to use the 1975 estimate as "a useful reference point" in order to show that "if they had been used in conjunction with the estimates of producer goods flows Mundle would have concluded that there was overall a net inflow of resources into agriculture during the period studied by him" (Mody 1980 p.5). This may be convenient to Mody's line of reasoning. But it is difficult to see the justification for using my 1975 estimate in this manner; placing it on an equal footing as it were with the 1977 revised estimate and suggesting that if only I had stuck to it I would have reached a different conclusion; for Mody is quite aware that having constructed the earlier time series I later found the commodity classification errors in it and had to replace it by the revised 1977 estimate where this error was rectified.

Rath concluded that the richer sections were being increasingly under represented in the NSS data. They even gave some prima facie reasons as to why this might be happening. It would follow from the Dandekar Rath contention that foodgrain consumption, which holds a larger share in the poor man's basket, gets systematically over estimated while non agricultural items like durable goods, services etc. which are typically consumed by the rich would get under estimated. However Bardhan (1971) first pointed out that if Dandekar and Rath had employed the appropriate price deflators in their inter-temporal comparisons, the anomaly they had discovered would itself be eliminated to a large extent. Subsequently Srinivasan, Radhakrishnan & Vaidyanathan (1974) argued persuasively that Dandekar and Rath's prima facie reasons for claiming the under representation bias were themselves quite untenable.<sup>8/</sup>

At the aggregative level the comparisons by Mukherjee and Chatterjee (1972) as well as that by Srinivasan, Radhakrishnan and Vaidyanathan (1974) show some difference between the official and NSS estimates of consumption expenditure, notably since 1963-64.<sup>9/</sup> However the differences are easily accounted for by statistical error margins, differences in concepts and methods of estimation. Certainly none of the above authors have asserted that the difference implies a bias in the NSS estimates.

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<sup>8/</sup> On this point see also Mundle (1975).

<sup>9/</sup> Incidentally the headings of the last three columns of Table 3 in Modi (1980) have got mixed up. Contrary to what the table indicates, Srinivasan, Radhakrishnan, Vaidyanathan (1974) found that the NSS estimates were consistently below the official estimates.

Turning to the pattern of consumption expenditure, which is of more immediate relevance to us, it is well known that the NSS data is the only available source for getting a continuous time series of expenditure patterns. However for some years we get comparisons between the NSS based estimates and estimates based on the product flow method for specific commodities. Such comparisons show that the NSS estimate are usually larger than the product flow estimates for items like foodgrains and 'fuel & light'. For most other items the NSS estimates are lower. (Mukherjee 1969, Mukherjee & Chatterjee 1972, Rudra 1972, Srinivasan, Radhakrishnan & Vaidyanathan 1974). However these specialists researching on the subject have seldom attributed the differences - in particular the higher foodgrain consumption estimate - to an over estimation bias in the NSS data.

The differences are generally attributed to differences in concepts, methods and coverage and so far as scientific validity is concerned the preference generally seems to be in favour of the NSS estimates over the product flow estimates. To cite one expert opinion, Mukherjee & Chatterjee (1972) state:

"Since the empirical basis of the product flow estimate is even weaker than that of the survey estimates for the components of consumption expenditure, in view of the application of relatively arbitrary allocation ratios and distribution margins on the values of output as produced, this discordance does not unequivocally establish that the survey estimates are at fault, in view of their stable patterns and systematic change".

Rudra (1972) is even more categorical in his preference for the NSS data. He states:

"The fact that the Residue Estimate of the CSO... have the stamp of authority and other Residue Estimates are also closely related to the official estimates of national income does not give these estimates any particular claim to superior scientific value. As a matter of fact superiority of scientific value undoubtedly attaches to the NSS estimates. The NSS estimates of individual commodities are the only estimates which permit of their errors being dealt with by probabilistic methods"

And further:

"There is no reason however to think that for foodgrains for which NSS estimates of consumption is higher than official estimates of available supply for human consumption are over-estimates—it is more likely that the official estimates are underestimates"<sup>10/</sup>

Mody commits precisely the error which Mukherjee & Chatterjee, Rudra and others have cautioned against. He cites a recent exercise by Sarma & Roy (1979) which shows as usual a higher consumption of foodgrains based on NSS data as compared to that estimated from the National Food Balance Sheet and interprets the difference to imply that "the NSS significantly over estimate foodgrain consumption"; going on to conclude that, this 'bias' could lead to an overestimate of foodgrain exported by agriculture of the order of 20-30 percent.

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<sup>10/</sup> It must be pointed out here that in the case of some specific items like gadgets and other consumer durables Rudra holds that the NSS figures are underestimates. However I am sure that even Mody would agree that for the problem at hand the magnitudes involved in such items would be quite insignificant.

It only remains to point out in fairness to Sarma and Roy that they themselves do not draw any such rash conclusions from their exercise. Like others writing on the subject before them, Sarma and Roy also point out that the two sets of data are not really comparable because of differences in concepts, methods of estimation etc. Furthermore while noting possible limitations in the NSS data they draw pointed attention to the limitations of the food balance sheet data itself such as its failure to take account of stocks, the implausibility of a fixed retention/wastage norm of 12.5% of production, etc.

To sum up the argument, neither has Mody established that my intersectoral resource flow estimates are highly sensitive to 'biases' in the NSS data nor is there a firm basis to his claim that the NSS does in fact significantly overestimate foodgrain consumption. His claim that in using the NSS data I have substantially overestimated the foodgrains export, and hence also the total resource outflow, from agriculture is thus not easily acceptable.

4. The Distribution Margin Mody's second criticism at the empirical level relates to the handling of distribution margins. For reasons spelt out earlier (see section 2 above) the measurement of intersectoral resource flows, when defined as the balance of trade, requires that in our computation of imports by agriculture from the non-agricultural sector should be valued at prices gross of distribution margins,<sup>11/</sup> whereas exports should be valued at prices net of

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<sup>11/</sup> And also gross of indirect taxes in my view. See the discussion in Section 2 above.

these margins i.e. producers prices. While I was able to follow this procedure appropriately in the case of producer goods exports and imports as also the import of consumer goods by agriculture, it was not possible to estimate the consumer goods exports from agriculture at producer prices since the NSS consumption data is valued at purchase prices except for the own produced consumption of farm households. Though I had pointed out this problem at the time of the original exercise,<sup>12/</sup> I was not able to indicate any quantitative magnitude for the order of the bias involved. Basing himself on a recent exercise by Joshi and Sharna (1979) Mody has now provided atleast some partial evidence to show that the bias involved may be quite significant.

Data on average price spread for rice during each quarter, starting from January, for the years 1960-61 to 1965-66 and 1966-67, to 1973-74 is given for six states (See Table 1). Mody concludes, taking a simple average over the four quarters for each state in each period, that over estimation on this account would be of the order of 20% to 30%. I myself would place the figure much lower since in four out of the six states the price spread is of the order of 14% to 15% during the 1st quarter or the main post harvesting season during which the bulk of the marketable surplus of rice arrives at the markets. Moreover Modi would certainly agree that the distribution margins for the rice crop alone - that too in six states does

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<sup>12/</sup> Mody is less than fair to me here when he states: "Interestingly enough, while Mundle questions my ignoring the distribution margins at the conceptual level, he himself does not seem to realise its empirical significance" (Mody 1980 p.7). For, while Mody may not have noted this problem in his original critique I myself have drawn attention to it on more than one occasion (Mundle 1977b p.157; Mundle 1981 p.66-67).

TABLE 1

## RETAIL FARM PRICE SPREAD IN SELECTED STATES

STATE	QUARTER	1960-61 to 1965-66		1966-67 to 1973-74		Between Periods Change in spread (3) - (1)
		Average Price Spread (%)	Coefficient of variat- ion (%)	Average Price Spread (%)	Coefficient of variat- ion (%)	
		(1)	(2)	(3)	(4)	
ANDHRA	I	15	62.53	18	105.54	+3
	II	17	33.98	19	104.54	+2
	III	23	85.09	25	63.61	+2
	IV	24	66.30	31	60.06	+7
BIHAR	I	15	136.39	15	133.75	0
	II	23	60.69	22	55.35	-1
	III	35	41.00	36	27.49	+1
	IV	24	110.38	24	27.76	0
KARNATAKA	I	14	140.36	14	179.99	0
	II	20	68.19	16	84.10	-4
	III	20	10.53	26	46.95	-6
	IV	26	95.25	23	81.97	-3
ORISSA	I	14	118.32	15	127.06	+1
	II	21	49.33	31	95.51	+10
	III	22	51.94	47	112.96	+25
	IV	20	74.13	33	94.82	+13
TAMIL NADU	I	18	53.54	19	74.83	+1
	II	20	64.17	21	67.00	+1
	III	22	31.31	22	55.81	0
	IV	22	26.18	23	57.14	+1
WEST BENGAL	I	27	46.21	30	23.46	+3
	II	22	99.67	28	102.21	+6
	III	31	46.10	34	97.13	+3
	IV	30	41.18	33	48.29	+3

Source: Joshi &amp; Sharma (1979)



not provides us with an adequate statistical base from which to gauge the distribution margin on the total export of all food crops and other consumer items like milk, fish, meat tobacco etc. from the agricultural (and allied activities) sector as a whole. Nevertheless I am in full agreement with him that the unavoidable inclusion of the distribution margin in the valuation of agricultural exports does introduce a significant upward bias in the estimate of net resource outflow. However, for reasons explained below, I would not go so far as to conclude that adjustment for this bias would give us an overall net resource inflow instead of my present estimate of a net resource outflow during the period between 1955-56 and 1970-71.

5. The Time Profile: I turn now to the question of the pattern of resource flow over time. The discussion arising out of my original estimate and Mody's subsequent critique has unfortunately focussed almost entirely on the direction of net resource flow i.e. whether there was a net outflow from, or inflow into, the agricultural sector in different years. The responsibility for this is largely mine I suppose for, evidently; I had not made it sufficiently clear at the outset that what really counted for my basic thesis where I attempted to relate the phenomenon of industrial stagnation since the mid sixties to the pattern of intersectoral resource flows (Mundle 1977a, 1981) - was not so much the absolute flows in individual years, whether positive or negative, but the changes in these flows over time i.e. the time profile. In particular I was concerned with verifying the hypothesis that upto about the mid-sixties the resource flow pattern was shifting against agriculture and subsequently the

pattern changed progressively in favour of agriculture atleast up to the end of my reference period in 1970-71.<sup>13/</sup> In short the hypothesis required that the time profile of net resource outflow from agriculture should follow on inverted u-shaped path, with a peak being reached around the mid sixties, regardless of whether the absolute magnitudes on that path lay above or below the zero net resource flow line.

As it turned out my time series of resource flows between 1951 and 1971 followed exactly such a path and for most years the absolute magnitudes happened to be above the zero-net resource flow line.<sup>14/</sup> The validity of the inverted u-shaped path has now been questioned by Mody (1980) who feels that it is more likely a statistical illusion. I shall try to show that this is not the case.

Mody's principle argument here is once again based on the distribution margin on agricultural exports as evidenced in the data of Joshi & Sharma on price spreads for rice in six selected states. His contention is that the price spread on agricultural consumer goods has been increasing, thus resulting in an increasing over estimation bias which for the increasing resource outflow from agriculture in my estimates. There are a number of problems with this argument. First it must be noted that my resource flow

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<sup>13/</sup> Notice that a resource flow pattern where the net inflow into agriculture decreased from the early fifties to about the mid sixties and then again increased (i.e. a negative outflow throughout) would be just as consistent with this hypothesis as the case where there is a positive net outflow from agriculture throughout, increasing at first from the early fifties to the mid sixties and then declining.

<sup>14/</sup> See Table 2 here and Charts 1 & 2 in Mody (1977b).....

series shows an increasing resource outflow from agriculture between the mid fifties and mid sixties (See table 2 Col.3). But the only

Table 2

Real Resource Outflow from Agriculture

Rs. Crores, 1960-61 price

	(1) NET EXPORT OF CONSUMER GOODS	(2) NET EXPORT OF PRODUCER GOODS	(3) NET RESOURCE OUTFLOW (1) + (2)
1951-52	-808.74	320.99	-787.59
1952-53	-1245.43	405.90	-952.57
1953-54	-887.52	511.70	-363.53
1954-55	-610.43	592.94	70.46
1955-56	-654.12	695.36	151.62
1956-57	-487.53	802.87	475.72
1957-58	-637.22	942.99	367.88
1958-59	-727.50	1061.38	314.07
1959-60	-714.27	1232.21	515.14
1960-61	-630.03	1424.78	695.43
1961-62	-643.33	1370.29	751.77
1962-63	-569.85	1416.05	848.75
1963-64	-446.80	1404.88	946.10
1964-65	-894.92	1345.65	358.62
1965-66	-959.52	1322.77	256.87
1966-67	-1011.21	1243.57	-34.89
1967-68	-1476.68	1087.22	-544.80
1968-69	-1457.52	998.28	-521.13
1969-70	-1554.63	888.97	-713.88
1970-71	-1443.48	659.30	-762.04

observation we get from the Joshi & Sharma paper which might be considered as falling within this period is the average price-spread over the years 1960-61 to 1965-66 (See Table 1). It is not clear to me how from this single 'average' observation we can infer that the price-spread, and hence the upward bias in resource flow estimates, was increasing during the period.<sup>15/</sup> Surely we need two observations atleast. And that we get only in comparing the price spread average for 1960-61 to 1965-66 with the same average for 1966-67 to 1973-74. Assuming for the moment that the latter figure is significantly higher than the former; this would presumably imply that the distribution margin, and hence the 'upward bias' in my resource flow estimates, had increased by the late sixties. But this is precisely the period during which my time series shows a decrease not an increase in the resource outflow.<sup>16/</sup> so in which phase of my time series do we,

<sup>15/</sup> Actually Mody's basis of inference is different. He employs some price spread elasticities with respect to population etc. computed by Joshi and Sharma to estimate the increase rate of price spread for 1960-61 to 1964-65 from the independent variables. (Mody 1980, table 7). His computation however is purely hypothetical. For while Joshi and Sharma have not given the functions from which they computed their elasticities they do state that these were linear functions fitted to observations covering the period 1960-61 to 1973-74 and gave coefficients of explained variation of only around 50%. It is easy to see that little can be inferred from these computations about the period 1960-61 to 1964-65 since both the best fit functions as well as the corresponding elasticities for this sub-period could be quite different.

<sup>16/</sup> Mody has explained this away as being simply a case of one bias being countered by another one, the latter allegedly arising from my adjustment of the NSS consumption data to match with the CSO data, such that what we see is only the weighted average of two biases (Mody 1980, p.10). I have verified that if I had calculated the resource flows without adjusting the NSS data to match the CSO data only the absolute magnitude would be altered but not the inverse u-shaped pattern. Also the sharp increases in the net inflow of consumer goods after 1963-64 which Mody thinks would not be observed but for my adjustment procedure are very much in evidence.

really see the distorting effect of an "increasing price-spread"?

Secondly it is doubtful whether the Joshi & Sharma data can really be interpreted as indicative of a significant rise in distribution margins for consumer goods exports from the agricultural sector as a whole. Joshi and Sharma do note a substantial increase in the absolute magnitude of price spread, but farm and retail prices also increased. What counts for measuring changes in distribution margins is the relative share or proportion of price spread in relation to price. It will be noticed from Table 1 (Col.5) that in relative terms the increase between the two period averages is really negligible—in fact negative or close to zero—in three out of the six states and also quite small in all the other states except Orissa. Since these increases are not statistical estimates of trend but simply a comparison between two period averages and the differences themselves are so small while the coefficient of variation is rather high in both periods (See Table 1 Cols. 2 & 4). I doubt whether we can say with confidence that the data shows a sustained increase in the distributive margins over time. Moreover, even if we grant for the sake of argument that this is true in the case of rice in the six states for which we have data, surely we cannot unequivocally infer from this that the pattern is generally valid for all consumption goods exported from the agricultural sector as a whole in the aggregate of all states.

Finally, Mody's argument about the inverse u-shaped time path being a statistical illusion runs purely in terms of the biases etc. in the consumption goods flow. However it will be evident from the data presented in table 2 that the same inverse u-shaped time profile

which we find in the aggregate resource flow pattern (Col.3) is also evident in the pattern of producer goods flow between the sectors (Col.2). Thus while the sharp increase of consumption goods inflows since 1963-64<sup>17/</sup> certainly accentuates the down phase of the aggregate time profile, the turning point behaviour of the latter basically reflects the pattern of producer goods flows over time. And so far as the inter-sectoral flow of producer goods is concerned, my own reliability tests (Mundle 1981) apart, Mody himself has constructed independent estimates which he claims agree closely with mine (Mody 1979 p.65).

In view of the forgoing we must conclude that the inverse u-shaped time profile of resource transfer from agriculture is not merely a statistical illusion as Mody believes, but a real phenomenon. And as a real phenomenon its immediate proximate causes can also be identified and analysed. As I had demonstrated in my original exercise (Mundle 1977a, 1981) these determinants of the pattern of inter sectoral resource flow can be analysed into basically three sets of factors. The changes in the relative rate of growth of output between agriculture and non-agriculture, changes in the inter sectoral input-output relations between the two sectors and finally the inter sectoral terms of trade. The model predicted that the real resource outflow would be related inversely with the terms of trade, the growth of agricultural output and the non-agricultural input coefficient of agriculture while it would be positively associated with the growth of non-agricultural output and the agricultural input coefficient of non-agriculture. Multiple regressions were run, using linear and semi log forms, to test these predictions empirically. And while this is admittedly a rather crude

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17/ Here see the comment in footnote 16 above.

test, the results turned out to be better than expected. The signs of all the coefficients were as predicted in both functional forms, the values of the coefficients being all significant or nearly significant at the 1% level in the linear form and in both cases the coefficient of explained variation was as high as around 90%.<sup>18/</sup>

#### 6. A Summing Up

To conclude I would say that the state of the discussion between Modi and me is as follows. So far as our differences at the conceptual level are concerned these seem to me to be confusions arising out of asking different questions rather than offering different answers to the same question. This seems to be especially true of the concepts of resource flow that we have employed. While I have defined the intersectoral flow of resources to mean the intersectoral balance of trade, Mody has been primarily concerned with viewing the resource flow as the net savings transfer. Once this has been clarified I think there is little ground left for disagreement—though Modi would probably still insist, so far as the treatment of indirect taxes is concerned, that imports by agriculture should be computed net of these taxes.

Our substantive differences arise in the context of my empirical estimates. While it is true that the NSS based estimates of foodgrain consumption exceed those based on product flow estimates I do not agree with Mody that this must necessarily be interpreted

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<sup>18/</sup> For a more detailed discussion of these issues see Mundle (1981)

as an over estimation bias in the NSS data and hence in my estimates of agricultural exports of consumption goods based on that data. On the contrary I have cited some specialists researching on this field who would hold that it is the product flow estimates which may be less reliable. The position regarding consumer durables is less clear but Mody would probably concede that the magnitudes involved here are not so important.

I would also not agree with Mody that the inverse u-shaped time profile of my resource flow series is a mere statistical illusion. I have tried to show in this context why Modi's arguments here are not easily acceptable and why the turning point behaviour of the resource flow pattern can be taken to be a real phenomenon well explained in terms of its proximate determinants.

Finally while there can be disagreement about the margin of bias involved, I would agree with Mody that the inclusion of distribution margins and indirect taxes in the computation of agricultural consumer goods exports leads to a significant over estimation bias. Indeed I had myself first drawn attention to this problem in the original exercise. Unfortunately there is no satisfactory means of adjusting for this bias since the distributive margins cannot be easily separated out in the NSS consumption expenditure data. However I would certainly not go so far as to suggest, as Mody does, that adjusting for this bias would turn my estimate of a net resource outflow from agriculture over a sustained period since the mid fifties into net inflows.



I say this because Mody has concentrated, in his empirical critique, in identifying mainly the sources of over estimation bias in my resource outflow estimates. There are however other limitations of the estimate which I have pointed out elsewhere (Mundle 1977a, 1980, 1981), such that in the final analysis it is difficult to say unequivocally that the estimates are either over estimates or under estimates. For an illustration in terms of Mody's own critique, it is evident that if we did accept his suggestion of computing agriculture's imports ~~net of indirect~~ taxes then this would introduce a very substantial escalation in the resource outflow estimates which could offset or even more than offset the opposite effect of a revaluation of exports at prices net of distribution margins. We may well end up with resource flow estimates which are not very different from, or are even larger than, my own estimates.

The conclusion I would draw therefore is that my estimates of intersectoral resource flow are no more than a crude first attempt to construct a time series for this variable and we shall have to interpret it with due caution. Since much of this crudeness has to do with the nature of the data itself, it is not easy to see how improvements may be brought in so long as we are constrained to work with the same basic sources of data. But nevertheless one hopes that it will be possible to replace the results of my first attempt soon by others which are more refined in atleast some respects.



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