Intra-Industry and Inter-Industry Trade in Switzerland

By

David Greenaway

— ....

Contents: I. Introduction. — II. Measurement of Intra-Industry Trade and Categorical Aggregation. — III. Intra-Industry Trade in Switzerland. — IV. Summary and Conclusions.

I. Introduction

The phenomenon of intra-industry exchange has been widely and consistently observed in developed market economies [e.g. Balassa, 1966; Grubel, Lloyd, 1975; Greenaway, Milner, 1982], less developed economies [e.g. Willmore, 1972; Balassa, 1979] and centrally planned economies [Pelzman, 1978]. Although early work focussed almost entirely on measurement, more recent work has shifted the emphasis towards explanation. Thus a number of models predicting the emergence of intra-industry exchange have recently been developed [e.g. Krugman, 1979; Lancaster, 1980; Brander, 1981] and there have been a number of econometric studies aiming at commenting on the determinants of inter-industry differences in intra-industry trade [e.g. Pagoulatos, Sorensen, 1975; Loertscher, Wolter, 1980; Greenaway, Milner, 1982].

The present study belongs primarily to the first group since the emphasis is on identification, although explanation will not be ignored. Our objective is to gain some idea of the extent of intra-industry trade in Switzerland; to examine inter-industry patterns in intra-industry trade; and to comment on trends in intra-industry exchange over the previous decade or so.

II. Measurement of Intra-Industry Trade and Categorical Aggregation

Perhaps the most frequently used measure of intra-industry trade is that developed by Grubel and Lloyd [1975][1], viz.,

[1] A number of measures were developed prior to Grubel and Lloyd's measure, for instance by Michaely [1962], Kojima [1964] and Balassa [1966]. In fact, the B_j reported in the text is basically 1 minus the Balassa "representative ratio".

$$B_j = \{[(X_j + M_j) - |X_j - M_j|] / (X_j + M_j)\} \cdot 100 \qquad (1)$$

which is usually presented in its more abbreviated form,

$$B_j = 1 - [|X_j - M_j| / (X_j + M_j)] \cdot 100 \qquad (2)$$

where $0 \leqslant B_j \leqslant 100$.

It is well-known that the extent of "trade overlap" as measured by B_j need not accurately represent the amount of intra-industry exchange which is taking place, because trade statistics may group together in the same category activities which have different factor intensities. To the extent that this occurs, the level of intra-industry trade is likely to be overstated. This problem has been referred to as "categorical aggregation" [Gray, 1979].

The problem is of course no more than one of satisfactorily defining an "industry" for empirical purposes. In principle, if one could operationalise the concept of an industry, the problem would disappear. Widely agreed criteria of what constitutes an industry would facilitate the regrouping of trade statistics and permit relatively trouble-free measurement[1]. In the absence of "widely agreed" criteria for regrouping, many investigators have argued that the third digit of the SITC is a reasonable approximation to an "industry", and indeed most empirical analysis is conducted at this level of aggregation. It was decided in the present study to proceed from the third digit, in part due to precedent but, more important, due to the fact that secondary data which could possibly be used for explanatory purposes tend to be most easily "matched" to the third digit[2].

To work uncritically with third-digit data is, however, to ignore the warnings implicit in the work of Finger [1975] and Rayment [1976]. Since regrouping was simply not feasible, other less ambitious avenues had to be explored. First more disaggregated data were examined, second an "adjusted" B_j was applied to third-digit data. The former involved simply calculating B_j at the fourth digit. One could object that there is no a priori reason why the fourth digit should conform any more closely to an industry than the third digit. The point is, however, that, if one observes a similar pattern of indices, and similar levels, then there is good reason for feeling more confident about three-digit levels as indicated by B_j. The second approach proceeded from the assumption that categorical

---

[1] Note however that, even in the event that one can identify "industries", problems may nevertheless remain, for example with regard to classifying parts and components.

[2] This proposition is based first on some work which the author has been doing on U.K. trade which necessitated marrying the SITC and U.K. SIC classifications. In addition, however, it is also based on preliminary attempts at marrying the SITC and the Swiss "Nomenclature Générale des Activités Economiques" (1975 edition).

aggregation manifested itself in trade imbalance. In other words, it is possible that when there are a number of say, fourth-digit activities with differing factor input ratios, this will manifest itself in a pattern of offsetting trade imbalances (at the fourth digit). When these activities are aggregated into a three digit group the imbalances are in effect aggregated, and the third-digit B_j is higher than it otherwise would be.

To the extent that categorical aggregation is associated with differing factor ratios we can make some adjustment for its effects. Instead of using B_j to measure intra-industry trade at the third digit we use C_j where

$$C_j = 1 - [\Sigma_i X_{ij} - M_{ij} \cdot / \Sigma (X_{ij} + M_{ij})] \cdot 100 \qquad (3)$$

and $C_j \leqslant B_j$

$$j = SITC\ 001 \rightarrow 899$$
$$i = (001.1 \dots .001.9) \rightarrow (899.1 \dots 899.9)$$

Note that we are not eliminating categorical aggregation in any sense. Differing factor ratios at the fourth digit could be consistent with imbalances having the same sign. All we are doing is making an allowance for that element of categorical aggregation which manifests itself in payments imbalance. If the Heckscher-Ohlin postulate (that countries specialise in accordance with relative factor endowments) is accepted, then the assumption that categorical aggregation does manifest itself in payments imbalance is not all that implausible. For further discussion see Greenaway and Milner [1982][1].

III. Intra-Industry Trade in Switzerland

Table 1 summarises our calculations by giving (among other things) details of the average three-digit B_j and C_j for each SITC Division for 1975[2].

[1] Aquino has argued that a further adjustment ought to be made to B_j to allow for the impact of *aggregate* payments imbalance. He contends that a more accurate measure would be:

$$Q_j = 1 - [\ \hat{X}_j - \hat{M}_j \ | \ / (\hat{X}_j + \hat{M}_j)] \cdot 100$$

where

$$\hat{X}_j = X_j \frac{1}{2} [(X_j + M_j) / \Sigma\ X_j]$$

(and likewise for $\hat{M}_j$). In other words one is effectively smoothing the effect of the aggregate imbalance. Greenaway and Milner [1981] have argued that this procedure may in fact create more distortions than it removes.

[2] 1975 was selected as being appropriate for many of the cross-section comparisons because this is the most recent year for which Census information is available — an important consideration for further empirical analysis, on which the author is currently engaged.

The first thing that we might notice is the effect of using C_j rather than B_j. If we compare Z and Z* in Table 1 we see that although, as we would anticipate, Z* < Z for all Sections apart from 3, the differences are relatively small. Even for Sections 5—8 the average reduction amounts to only 8.94 percent. If categorical aggregation is manifested in trade imbalance then our calculations for C_j suggest that it is not creating too much of a distortion[1].

Table 1 — *Summary Statistics of Intra-Industry Trade in Switzerland, 1975*

SITC Section	Z	V	Z*	W
0 Food and Live Animals Chiefly for Food . .	24.1	1.14	17.9	16.9
1 Beverages and Tobacco	21.5	0.52	19.2	24.5
2 Crude Materials Inedible Except Fuels . .	33.0	0.87	31.9	30.7
3 Mineral Fuels Lubricants and Related Materials	8.5	1.18	8.5	13.2
4 Animal and Vegetable Oils	65.2	0.34	40.0	28.0
5 Chemicals and Related Products	60.1	0.47	55.7	55.2
6 Manufactured Goods	52.1	0.53	47.8	46.8
7 Machinery and Transport Equipment . . .	53.2	0.41	47.9	46.5
8 Miscellaneous Manufactured Articles . . .	63.4	0.39	56.9	54.8

Note:
Z   = Arithmetic (unweighted) mean of three-digit B_j's.
V   = Coefficients of variation of B_j's in each Section.
Z* = Arithmetic (unweighted) mean of three-digit C_j's calculated from four-digit data.
W   = Arithmetic (unweighted) mean of four-digit B_j's.

Greater confidence in the use of B_j at the third digit was also inspired by the outcome of calculating B_j's for fourth-digit sub-groups. The results of this exercise are also reported in Table 1 where average four-digit levels are provided on a Divisional basis. Again the point to note is that although W < Z, for most Sections the average reduction for SITC 5—8 is only of the order of 12 percent.

One final point should be noted on this issue. In the only other study investigating intra-industry trade in Switzerland with which the author is familiar, Blattner [1977] also recognised the distorting effect of categorical aggregation and explored its implications by disaggregating. An interesting feature of Blattner's study is that he did not use the SITC but rather the Swiss Customs Classification. Blattner concentrated attention on consumer goods and investment goods and found that

---

[1] In order to ensure that this result was not simply dependent on choice of year, comparisons were also made for 1965, 1970 and 1977, with similar findings.

disaggregation did not result in a disturbing fall in the indices. Thus, even when measured according to different classifications, intra-industry trade persists upon disaggregation.

Inter-Industry Differences

When we examine Table 1 more closely, the following distinctive features are apparent:

— Whether we take B_j or C_j, higher levels of intra-industry exchange are observed in SITC Sections 5—8 than in Sections 0—4. This conforms to findings which relate to a number of other countries. Trade in commodities differentiated by attributes (and trade in product cycle goods which is measured as intra-industry trade) can be expected to be concentrated in Sections 5—8.

— Not only do levels of intra-industry trade tend to be higher for groups in Sections 5—8, there is also less variation in recorded indices. There is in other words, a much wider spread of three-digit indices in SITC 0—4 than in SITC 5—8. Table 1 reports coefficients of variation associated with three-digit B_j's in each Section. It is clear that there is somewhat less variability in Sections 5—8 than in 0—4.

If one examines B_j's for the endpoints of our reference period it is possible to gain some idea of how levels of intra-industry trade have altered through time. (Table 2 compares average three-digit indices for 1965 and 1977. These years were the earliest and latest years for which accessible data classified according to SITC/RI were available). For all SITC Sections, the unweighted average has risen over the period. An interesting feature of this table is, however, that the increase in intra-industry trade has been proportionately greater in Sections 0—4 than in 5—8, in particular in Sections 1 and 4. Both groups comprise Sections with relatively few three-digit industries, and in both cases individual industries can be identified as being largely responsible for the changes: in the case of SITC 1, a greater proportionate increase of exports than imports in 111 (Non-Alcoholic Beverages) and 121 (Tobacco); in the case of SITC 4 a similar explanation applies to 411 (Animal and Vegetable Oils). Swiss foreign trade is of course dominated by manufactured goods. In 1965 some 92 percent of total merchandise exports came from activities grouped under SITC Sections 5—8. By 1977 this predominance had in fact increased marginally to a share of 94 percent. Manufactures dominate merchandise imports also, accounting for 70 percent of total imports in 1965, and 76 percent in 1977. (If anything, these figures understate the increasing importance of manufactures, since they are taking an increasing share of an in-

creasing total). The point is, although there has been a marked increase in measured intra-industry trade at the three-digit level in SITC 0—4, the overall increase in the importance of intra-industry trade over the period is rather more modest, because of the relatively small fraction of total trade for which these activities account. Total trade is dominated by trade in manufactures, and, as we can see from Table 2, indices on average changed very little in Sections 5—8.

Comparisons With Other Countries

A clearer perspective on these trends can be gained from comparing the findings with information for other developed market economies. Table 2 compares average three-digit levels for Switzerland in 1965 and 1977 with average three-digit levels for six other Western European countries (for 1964 and 1977). As we can see, higher levels have been recorded in SITC 5—8 for all countries, although the extent to which average B_j's in Sections 5—8 exceed averages for Sections 0—4 varies from one country to another (compare for example Belgium with Italy). If we take an overall average (simply for comparative purposes), we find that the Swiss figure is lowest in both 1964 (1965) and 1977. Taking simple averages is to some extent misleading, however. In most of the other countries covered by Table 2, trade in SITC 0—4 is quantitatively more important than in Switzerland. If we take weighted averages, or simply confine our attention to average levels in SITC 5—8, we find that although the average for Switzerland is still second-lowest in the first year given, it is much closer in this year to that for all other countries in the sample than it is in the latter year.

Table 2 — *Intra-Industry Trade in a Number of European Countries, 1964 (1965) and 1977*

SITC Section	Switzerland		Belgium-Luxembourg		Netherlands		Germany		France		Italy		United Kingdom	
	1965	1977	1964	1977	1964	1977	1964	1977	1964	1977	1964	1977	1964	1977
0	21	24	48	53	45	62	26	39	43	39	30	22	22	35
1	8	36	49	52	60	57	41	54	46	36	29	35	28	35
2	31	33	41	50	39	45	26	38	45	64	26	23	19	40
3	1	3	41	18	47	33	33	29	48	35	20	20	35	58
4	33	62	66	67	62	57	41	66	44	62	28	46	29	50
5	58	58	65	71	71	63	52	60	69	75	60	65	56	69
6	44	57	56	69	64	71	58	71	64	73	56	53	52	69
7	62	61	69	73	67	78	39	52	74	79	74	69	51	69
8	56	57	66	65	61	64	58	69	74	74	55	45	75	80
$\bar{x}$ (0—8)	35	43	56	59	58	60	41	53	56	60	41	43	41	56
$\bar{x}$ (5—8)	55	57	64	70	66	70	52	63	70	75	60	60	59	72

Source: Data for 1964 taken from Grubel and Lloyd [1975, Table A.3.1]. All other figures calculated from OECD, *Overseas Trade Statistics*, var. issues.

Over the period 1964 (1965) to 1977, and especially during 1964 (1965) to 1973, a number of developments could be viewed as encouraging an increasing importance of intra-industry trade in manufactures:

— Trade liberalisation. Within this period there was increasing liberalisation of trade flows, most notably due to the Kennedy Round of tariff cuts. We would expect lower tariff barriers to be associated with increased international specialisation. To the extent that factor endowment determinants are important, this specialisation will take the form of inter-industry specialisation. Where, however, factor endowments are similar (as among the Western European developed market economies), one would expect intra-industry specialisation to increase. Hufbauer and Chilas [1974] in fact go so far as to argue that the pattern of tariff liberalisation has been deliberately geared to encourage intra- rather than inter-specialisation. If intra-industry specialisation does ensue, then the importance of intra-industry trade should increase[1].

— Economic integration. Market expansion associated with trade liberalisation is even more significant (in principle anyway) when it is the concomitant of economic integration. Not only does the very process of integration widen markets and permit the lengthening of production runs and realisation of scale economies, one often finds that certain socio-political forces ecourage intra-industry specialisation. For instance, integration is invariably attempted between countries at a broadly similar stage of development, which have broadly similar political systems. There is therefore greater potential for overlapping tastes [see Linder, 1961]. It has been argued by a number of commentators that the latter provides a stimulant to intra-industry exchange.

— Real income growth. Notwithstanding the depressionary impact of the "oil shock" of 1973, 1964/65—1977 was a period of generally rising real incomes — especially for the developed market economies. Since the seminal contribution of Linder [1961] it has been generally recognised that real income growth and the growth of intra-industry trade are closely associated. The mechanism is simply that as real incomes increase, the demand for "variety" increases, consumption of

---

[1] The Hufbauer and Chilas argument is based on the assertion that adjustment costs associated with trade expansion will be lower for intra- compared with inter-industry exchange. Although this appears to be a widely accepted postulate, little systematic effort has been devoted to the issue. Krugman [1981] provides some justification for differential adjustment costs whilst Greenaway [1982] comments on adjustment costs within the wider context of the welfare gains from intra-industry exchange.

imported varieties increase and domestic producers strive to market varieties which appeal to domestic and overseas consumers[1].

As we can see from Table 2, however, the increase in average intra-industry trade in Sections 5—8 in Switzerland over this period has been relatively modest. Only in Section 6 does the increase appear at all marked. This contrasts with experience in other countries. Take the United Kingdom for example, the country for which average levels of three-digit B_j's in 1964/65 were closest to those of Switzerland. Here the increases are much greater (both in absolute and proportionate terms). Thus the obvious question is begged, why has the level of intra-industry trade changed so little in the Swiss case when other countries in Western Europe have experienced a more marked change? Put another way, why has inter-industry trade retained roughly the same importance over this period?

One possibility is that Switzerland has not been influenced by the trends mentioned above to the same extent as the United Kingdom in particular and her European neighbours in general. This, however, is unlikely to be the case where the trade liberalisation and real income growth factors are concerned. Real income per capita has grown at a comparable rate (from a higher base) and, if the Hufbauer and Chilas argument is accepted, the greater concentration of Swiss trade in manufactured goods should have resulted in trade liberalisation generating more, rather than less, intra-industry exchange. The only influence of those mentioned above which may have been significant is economic integration. All other countries included in Table 2 are either founder members of the European Community or a late entrant (the United Kingdom). Although Switzerland enjoys the benefit of preferential trading arrangements with the Community (four members of which account for 40 percent of her total trade), as a non-member she may not benefit to the same extent from the elimination or reduction of non-tariff barriers as can full members. It is possible, therefore, that intra-community intra-industry specialisation makes a contribution to explaining differences in the level and change in intra-industry trade that emerge when one compares Switzerland with Community members.

A second characteristic is however likely to be more influential, namely, country size. Switzerland is a relatively small country, not only physically, but in terms of her population. Some years ago Drèze [1961] suggested that "small" countries will tend to specialise in commodities

---

[1] This list of factors encouraging intra-industry trade confines itself to general influences. The influence of country- and industry-specific factors is really beyond the scope of this article.

which are standardised. The reason for this is that their small size limits the extent to which they can benefit from scale economies in production when differentiated goods are produced. The domestic market may be too small to permit a number of varieties to be simultaneously produced in competition with imports from larger trading partners, and export markets cannot be depended upon because of competition in the recipient markets. Consequently, specialisation takes place in commodities where the final good is "standardised" in the sense that the scope for attribute differentiation is limited. A number of recent models of intra-industry trade have arrived at a similar conclusion from a more formal viewpoint. The scope for intra-industry trade depends (among other things) on the number of pre-trade varieties which exist. Other things being equal, the larger the relevant market, the greater the number of firms operating at minimum efficient scale of production which can be accommodated, and the greater the number of varieties produced. Drèze invoked this explanation when commenting on the commodity composition of Belgian exports. A "small" country can of course also reap the benefits of long production runs by concentrating on highly specialised product lines where the products concerned are produced according to detailed specifications. In this case "vertical" differentiation is important. In other words, quality differentiation rather than attribute differentiation is the relevant product dimension from the consumer's standpoint. The importance of this distinction is that indices of intra-industry trade can be expected to be lower and more stable where the commodities concerned are differentiated vertically rather than horizontally[1]. One develops a comparative advantage in specialised product lines, and minor alterations in product specification in response to preference diversity have a limited effect on demand.

On the basis of casual empiricism one can find some support for this possibility. If one examines the composition of exports one finds that 6 three-digit categories account for more than 40 percent of total Swiss exports. Of these, at least three can be classed as intermediate goods for which attribute differentiation is likely to be less important than for consumer goods (717, Textile and Leather Machinery; 719 Machinery and Appliances, Non-Electrical; 729, Other Electrical Machinery and Apparatus). Two further categories cross the intermediate/final good classification (512, Organic Chemicals; 541, Medicinal and Pharmaceutical Products). The final category is a "consumer good" activity where at-

---

[1] The distinction between horizontal and vertical differentiation is important from a theoretical standpoint, precisely because the pattern of trade associated with each is likely to differ. The distinction is more problematic from an empirical standpoint [see Greenaway, 1983].

tribute differentiation may be important, but where product quality and repute are even more important (864, Watches and Clocks).

This concentration of exports on a fairly narrow range of product lines is probably the single most important reason why indices of intra-industry exchange are on average relatively low, and have changed relatively slowly. It is of course relevant to the explanation of the pattern of intra-industry trade in other small economies. There are of course other influences in the Swiss case, not least her comparative advantage in services, which accommodates a net import position across a wide range of manufactures, and contributes thereby to relatively low indices of intra-industry trade. A comprehensive explanation of the role which the service sector plays is however beyond the scope of the present article.

IV. Summary and Conclusions

The objectives of this paper were to ascertain the extent to which intra-industry exchange took place in Switzerland over the period 1965—1977. The following conclusions can be drawn from the analysis:

— On the basis of two different measures we found that evidence of intra-industry exchange could be found for Switzerland throughout the period 1965—1977.

— Those checks which were conducted to establish the influence of categorical aggregation indicated that recorded intra-industry trade could not solely be explained by reference to this phenomenon. In other words, non-factor proportions influences do contribute to determining the commodity composition of Swiss trade flows.

— Closer examination of the inter-industry pattern of indices revealed a similar pattern as has been found for a number of other developed market economies. In particular the greater evidence of intra-industry exchange in manufactures has been given wide support elsewhere.

— When compared with other Western European nations we find that average levels of intra-industry trade in Switzerland are relatively low, and they changed little over the period 1965—1977, in particular in SITC 5—8. A certain amount of qualitative evidence can be marshalled to support the conjecture that this is related to her relatively small size and a consequent tendency to specialise in and export a relatively narrow range of product lines[1].

---

[1] A full and comprehensive explanation of all the factors which influence recorded intra-industry trade in Switzerland relative to other Western European countries would necessitate a detailed econometric analysis of the determinants of intra-industry trade, as well as an acknowledgement of the comparative advantage in services, which Switzerland enjoys. This rather more ambitious objective is the subject of another paper.

References

Aquino, Antonio, "Intra-Industry Trade and Inter-Industry Specialization as Concurrent Sources of International Trade in Manufactures". *Weltwirtschaftliches Archiv*, Vol. 114, 1978, pp. 275—296.

Balassa, Bela, "Tariff Reductions and Trade in Manufactures Among the Industrial Countries". *The American Economic Review*, Vol. 56, 1966, pp. 466—473.

—, and the **Development Research Center, World Bank,** *Intra-Industry Trade and the Integration of Developing Countries in the World Economy.* World Bank Staff Working Paper, No. 312, Washington 1979.

Blattner, Niklaus, "Intraindustrieller Außenhandel. Empirische Beobachtungen im Falle der Schweiz und theoretische Interpretationen". *Weltwirtschaftliches Archiv*, Vol. 113, 1977, pp. 88—103.

Brander, James A., "Intra-Industry Trade in Identical Commodities". *Journal of International Economics*, Vol. 11, 1981, pp. 1—14.

Drèze, Jacques, "Les exportations intra C. E. E. en 1958 et la position belge". *Recherches Economiques de Louvain*, Vol. 27, 1961, pp. 717—738.

Finger, J. M., "Trade Overlap and Intra-Industry Trade". *Economic Inquiry*, Vol. 13, 1975, pp. 581—589.

Gray, H. Peter, "Intra-Industry Trade: The Effects of Different Levels of Data Aggregation". In: Herbert Giersch (Ed.), *On the Economics of Intra-Industry Trade. Symposium 1978.* Tübingen 1979, pp. 87—110.

Greenaway, David, "Identifying the Gains from Pure Intra-Industry Exchange". *Journal of Economic Studies*, Vol. 9, 1982, pp. 40—54.

—, "The Measurement of Product Differentiation for Empirical Analyses of Trade Flows". In: H. Kierzkowski (Ed.), *Monopolistic Competition and International Trade.* 1983, forthcoming.

—, and **Chris Milner,** "Trade Imbalance Effects and the Measurement of Intra-Industry Trade". *Weltwirtschaftliches Archiv*, Vol. 117, 1981, pp. 756—762.

—, —, *Inter-Industry Patterns in Intra-Industry Trade in the U.K.: An Econometric Analysis.* University College at Buckingham, Discussion Paper No. 9, 1982.

Grubel, Herbert G., and **P. J. Lloyd,** *Intra-Industry Trade: The Theory and Measurement of International Trade in Differentiated Products.* London 1975.

Hufbauer, Gary C., and **John G. Chilas,** "Specialization by Industrial Countries: Extent and Consequences". In: Herbert Giersch (Ed.), *The International Division of Labour: Problems and Perspectives. International Symposium.* Tübingen 1974, pp. 3—38.

Kojima, Kiyoshi, "The Pattern of International Trade Among Advanced Countries". *Hitotsubashi Journal of Economics*, Vol. 5, 1964, pp. 16—36.

Krugman, Paul R., "Increasing Returns, Monopolistic Competition, and International Trade". *Journal of International Economics*, Vol. 9, 1979, pp. 469—479.

—, "Intra-Industry Specialization and the Gains from Trade". *Journal of Political Economy*, Vol. 89, 1981, pp. 959—973.

Lancaster, Kelvin, "Intra-Industry Trade Under Perfect Monopolistic Competition". *Journal of International Economics*, Vol. 10, 1980, pp. 151—175.

Linder, Staffan Burenstam, *An Essay on Trade and Transformation*. New York 1961.

Loertscher, Rudolf, and **Frank Wolter,** "Determinants of Intra-Industry Trade: Among Countries and across Industries". *Weltwirtschaftliches Archiv*, Vol. 116, 1980, pp. 280—293.

Michaely, Michael, "Multilateral Balancing in International Trade". *The American Economic Review*, Vol. 52, 1962, pp. 685—702.

Pagoulatos, Emilio, and **Robert Sorensen,** "Two-Way International Trade: An Econometric Analysis". *Weltwirtschaftliches Archiv*, Vol. 111, 1975, pp. 454—465.

Pelzman, Joseph, "Soviet-COMECON Trade: The Question of Intra-Industry Specialization". *Weltwirtschaftliches Archiv*, Vol. 114, 1978, pp. 297—304.

Rayment, P. B. W., "The Homogeneity of Manufacturing Industries with Respect to Factor Intensity: The Case of the United Kingdom". *Oxford Bulletin of Economics and Statistics*, Vol. 38, 1976, pp. 203—209.

Willmore, L. N., "Free Trade in Manufactures Among Developing Countries: The Central American Experience". *Economic Development and Cultural Change*, Vol. 20, 1972, pp. 659—670.

*   *   *

Zusammenfassung: Intra-industrieller und inter-industrieller Außenhandel der Schweiz. — Eine wachsende Zahl empirischer Untersuchungen hat gezeigt, daß der intra-industrielle Handel einen relativ großen Teil des gesamten Außenhandels eines Landes ausmacht, besonders wenn es sich um Industrieländer handelt. Außerdem scheint der Befund darauf hinzudeuten, daß die Bedeutung dieses Phänomens zunimmt. In diesem Aufsatz werden zwei verschiedene Meßkonzepte des intra-industriellen Handels benutzt, um die Bedeutung dieses Teils des schweizerischen Außenhandels zwischen 1965 und 1977 zu untersuchen und die Schweizer Erfahrung mit der einer Anzahl anderer westeuropäischer Länder zu vergleichen. Die Ergebnisse lassen vermuten, daß der beobachtete intra-industrielle Austausch nicht allein mit dem Hinweis auf die Aggregation der Warenkategorien erklärt werden kann und daß das Phänomen für die Schweiz von geringerer Bedeutung ist als für andere westeuropäische Volkswirtschaften.

*

Résumé: Le commerce intra-industriel et inter-industriel de la Suisse. — Un nombre accroissant des recherches empiriques a démontré que le commerce intra-industriel est responsable pour une part relativement grande du commerce total particulièrement si le commerce des économies développés de marché est concerné. De plus, l'évidence semble suggérer que l'importance de ce phénomène a augmenté. Cet article applique deux mesures différentes du commerce intra-industriel pour analyser l'importance du phénomène sur la période 1965—1977 et pour comparer l'expérience de la Suisse avec lesquelles d'un nombre des autres pays européens occidentaux. Les résultats suggèrent que le commerce intra-industriel ne peut pas être expliqué exclusivement en référant à l'agrégation catégorielle et que le phénomène est moins important que dans des autres économies européennes occidentales.

*

Resumen : Comercio intra-industrial e inter-industrial de Suiza. — Un cuerpo creciente de evidencia empírica ha demostrado que el comercio intra-industrial contabiliza una proporción relativamente grande del comercio total, especialmente cuando se refiere a economías de mercado desarrolladas. Adicionalmente, la evidencia parece sugerir que la importancia del fenómeno ha ido aumentando. Este estudio utiliza dos medidas diferentes de comercio intra-industrial para examinar la importancia del fenómeno para el período 1965—1977 y comparar la experiencia suiza con aquélla de una serie de otros países europeos occidentales. Los resultados sugieren que la intra-industria registrada y el intercambio no pueden ser explicados solamente con referencia a agregación categórica, y que el fenómeno es menos importante que en otras economías europeas occidentales.