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Research Report No. 95

EFFECTS OF INTRA-SOCIALIST TRADE ON INDUSTRIAL STRUCTURE GROWTH AND EFFICIENCY: A CASE FOR SPECIALIZATION IN AGRICULTURAL GOODS

by

Gur Ofer

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INTRODUCTION

In two earlier papers[1] it was found that, contrary to what the image of their growth strategy may appear to be, Socialist countries--especially the less developed among them--employ a larger proportion of their labor force in agriculture than do equally developed market economies. Likewise, it has been shown that despite a very rapid industrialization drive, at growth rates much higher than in most comparable market economies, the urban sectors in those countries are relatively smaller (as measured by the proportion of the residing population) than in the corresponding market economies. The apparent contradiction is 'solved' by showing that part of the urban deficiency in Socialist countries (SOC) is due to an abnormally low level of economic activity and employment in the service industries, mostly located in cities. The other part results from the choice of production techniques made by SOC: highly capital intensive techniques in manufacturing and highly labor intensive ones in agriculture, in both cases in a much higher degree than in market economies. The rational offered for such a policy aiming to economize on urbanization, at least during early stages of industrialization, are the very high costs involved i.e., the capital needed for urban infrastructure and the costs of moving large numbers of people from the countryside. Such a strategy of economizing on urbanization and of inputs substitution between manufacturing and agriculture is much more suitable for the less developed among SOC (all of them except Czechoslovakia, East Germany, and to some extent Hungary), which had an over concentration

of people in rural areas and agriculture and a large initial deficiency in urban infrastructure when they became socialist.

The question that is still left unanswered is to what extent such a growth strategy is indeed the optimal one. An important aspect of this question is whether the policy implications of such a strategy with respect to the agricultural sector are optimal; that is, could one avoid a very severe loss in total factor productivity in agriculture by merely substituting labor for capital (and other out-of-agriculture inputs), as if along a given isoquant? Since modernization of agriculture is strongly embodied in capital and market inputs, there seems to be a general agreement that the answer to at least this last question is negative.[2] Indeed, because of the 'neglect of agriculture' which is a recognized part of the 'Socialist growth strategy' there developed a general shortage of agricultural products--food and non-food raw materials, in the socialist block. That shortage manifested itself by the inclusion of agricultural products within the 'hard' goods category, and resulted in a growing dependency of the countries of East Europe for agricultural originated imports, first on the Soviet Union and then--together with the Soviet Union--on countries outside the block. The growing world-wide scarcity in A-originated products that had developed in recent years further engraved the already severe hard-currency problem for SOC. This neglect of agriculture can certainly be identified as a serious mistake in structural planning, that may have also important political repercussions on both East-West and Soviet-East European relations.

What seems to be a collective mistake of all SOC (or of CMEA) would have been a much more serious misplanning on the part of the less developed (and southern) countries in the group had they not foreseen those developing

A-originated shortages and plan accordingly. It seems, on the face of it, that if one country would be willing to diverge, at least partly, from the strict prescription of the Socialist industrialization strategy and to specialize in A-originated products, it could enjoy, within CMEA, economic gains that should with less sacrifice and efforts, allow for a higher rate of growth activity. While in the free world the debate between the two growth strategies, the 'primary' production and export oriented and the manufacturing-import-substitution may still be unsettled, it seems very plausible that within a semi-autarkic group of countries that are following with extra zeal the second of these strategies--one or two countries adopting the first could and should flourish.

While working on the industrial structure of SOC it occurred to us that certain characteristics of Bulgaria's internal structure and of its foreign trade indicate a trend towards a distinctly more A-originated production and trade strategy than that of all other SOC, especially the less developed ones, and particularly that of Rumania.[3] The Bulgarian-Rumanian differences fit nicely with their different approaches towards CMEA. While Rumania in the name of the orthodox growth strategy of self-full-industrialization has limited its relations and level of cooperation with CMEA, Bulgaria maintained hers, presumably going along with some of the demands made by the more developed SOC to specialize according to its relative advantage.[4]

The main purpose of the paper is to try to identify whether or not there was an effort by any less-developed SOC to 'swim against the stream' in its trade and internal production structure and priorities, especially with respect to the A-sector; and if possible to try to evaluate the economic consequences of such a policy.

Section II presents a case for specializing in A-products *within* SOC in the framework of the theoretical concepts of trade under socialism and its practical execution in East-Europe during the 1950-70 period. In Section III the Socialist pattern of trade, especially in A-goods, is compared with a 'normal' market economy trade structure. On the basis of the identified SOC pattern we look for deviations in the direction of more A-trade specialization. In Section IV we compare the behavior of Bulgaria with respect to its A-sector with that of all the other countries but especially with that of Rumania (and to a lesser extent, Yugoslavia). The normative conclusions are left for the concluding section.

II. A CASE FOR SPECIALIZATION IN A-PRODUCTS UNDER CMEA'S IDEOLOGICAL AND ACTUAL TRADE UMBRELLA

The structure and direction of trade among SOC are determined by a host of factors, the most important being the ideological determined growth strategy; the level of economic development of the countries and the spread in levels of development among them; the economic and political dominance of the Soviet Union; and, of course, natural endowments, terms of trade and the degree of access to trade with other countries. The last two factors mentioned are at least partly dependent on the earlier ones. Likewise, the structure and direction of trade of SOC change over time in response to changes in these factors, the most extreme example being of course when, after World War II, a new political and economic leadership introduced a new economic system.

Most of the *ex-ante* ideological[5] factors seem to work against specializing in A-trade, or for that matter, production. According to socialist growth strategy, agriculture should supply the food and industrial raw materials essential to minimum needs of the population and spare all its extra resources

to help in the industrial drive. Active development of agriculture will absorb scarce resources needed for the industrialization effort, which needs very little A-raw materials, if any at all, since it is concentrated in heavy industry. Economic development through agriculture, even if collectivized, is politically dangerous and in any case holds off the development of ideologially conscious proletariat. Collectivization in itself when considered an ideological necessity, may also contribute to difficulties in making agriculture a productive fast growing sector.

There is a long ongoing debate in the Western literature on whether or not and to what extent 'autarky' is also one of the elements of Socialist growth strategy. Without going into this debate it seems quite clear that while some degree of autarky is either a norm and/or a consequence of this strategy (see the lower than normal trade and GNP proportions) it has always been legitimate or even desirable to export surplus agricultural products in order to acquire, from the more developed SOC, the machinery necessary to speed-up the industrialization drive. The conflict created here between the internal production priority against agriculture and the need of A-goods to pay for imported machinery is ideologically and practically solved by either reducing urban consumption of A-goods or by putting more pressure on agriculture to increase sales (procurement) to the public sector; or, only periodically, by a stop-gap effort to increase A-production for export purposes in the short run.[6] The eventual increase in industrial production in the long run, will preempt the need for such exports.[7]

The *ex-ante* ideological and strategic bias against agriculture, at least as far as production is concerned, has contributed much to the developing scarcity of A-products in the group. This scarcity has been strongly reinforced

by two *ex-post* developments: one is the failure of the agricultural policies of SOC to develop even at the minimum rate that had been planned and the second is the higher than expected rate of increase in local food (and light industry products) consumption since 1953-55, due to internal pressures of the population. Part of the created gaps have been closed by giving more priority status to the A-sector and part by, now welcomed, imports.

The ideological bias against the A-sector and against systematic long-run A-specialization stands in direct conflict at least with the initial structure of the comparative advantages of the East-European Socialist group of countries: that the Socialist block was made up of countries with a wide range of levels of development certainly raises the potential for growth, and even for industrialization along different paths with more 'Socialist division of labor' where the less developed and more naturally endowed for A-production members of the bloc, would follow a more 'classical' industrialization process--with higher levels of A-production and specialization and higher emphasis on light industry, etc... to the benefit of all countries. While the ideological bias made such a strategy more difficult to follow,[8] it increased substantially the potential for economic gains of a country that would find the way, to adopt it.

Here, we must emphasize the important difference in Socialist context, between extractive raw materials (metals, energy sources) on the one side, and A-originated products on the other, that together make the primary goods sector. While according to the general theory of economic development the relevant distinction is between primary production as a whole and manufacturing, according to the Socialist theory, extractive industries are an important part of heavy industry--the leader of the industrialization drive.[9] In this

respect these industries are on the opposite side of agriculture on the Socialist ideological spectrum. If after a number of years of very intensive efforts by all SOC to develop their own raw material base they relaxed it to a degree of creating a general block scarcity, it is partly because of the exorbitant costs involved, especially in capital, and partly because of the readiness of the Soviet Union to shoulder much of the burden.[10] In the discussion that follows, we shall concentrate only on trade in A-originated products which, like raw materials, are scarce but unlike them enjoy a better ideological status.

The presence of the dominant economic and political power of the Soviet Union within the block has affected the structure of its trade beyond what is implied by the emulation of its growth strategy. First, the Soviet Union's huge endowment of natural resources and its willingness to supply them to the block's countries allowed the latter to limit raw material developments to lower levels than those required by their ambitious heavy industrial development plans. In the past, this was also true with respect to food and other A-products. The Soviet Union's ambitious plans to increase its own food consumption and the failure of its agriculture to stand up to these plans have recently contributed to the aggravation of the A-products shortage in the block as a whole.[11] Furthermore, Soviet reparations demands during the late 40's and early 50's and its unsatiated demand for machinery may have pushed the more developed SOC towards a concentration in machine-building (MB) above that warranted by the strictest adherence to the Socialist growth strategy.[12] This may have increased the relative glut in machine-building capacity which is another point in favor of specializing in A-products.

More than mere excess capacity, it seems that it is the slow pace of

technological advances in the MB industries of the more developed SOC, that contributed to the relative glut for East European produced machinery. The failure of these countries to advance their MB sector fast enough to new technologies, to more sophisticated types of equipment, thus leaving the market of the more ordinary equipment to the less developed members, is no less responsible for turning machines into 'soft' goods than the latter's eagerness to create a MB sector of their own at early stages of development.[13]

The ideological and economic factors mentioned above have created two categories of goods within the CMEA block, 'soft' and 'hard' goods--the A-originated products included in the latter. Had the relative prices between the two groups been scarcity prices, economic motives would have pushed the whole block towards the production of hard goods. The prolonged presence of 'soft' and 'hard' goods, however, is the best indication that the relative prices are not scarcity prices, and that the actual price differences between soft and hard goods may discourage specialization in the right direction. Direct evidence on terms of trade between 'soft' and 'hard' goods fully supports this conclusion. Almost all of the studies carried on this subject for periods after the mid 50's show that as compared with world market prices or with CMEA production costs, hard goods are underpriced, most severely among them A-goods.[14] Wrong prices cannot only discourage specialization in A-goods, but actually outweigh all the arguments working in the opposite direction. However, as usual in a situation where prices cannot move freely, substitutes to prices develop that give at least partial compensation to the otherwise loosing party. The most important such substitute developed in trade among SOC seems to be 'package deals' mostly bilateral trade agreements in which a buyer of 'hard' goods has to also buy a certain amount of soft goods, i.e., machinery and

equipment, at high prices.[15] The problem with such an arrangement is that the only way to gain in trade from A-specialization within the block is to produce and export soft goods in a quantity large enough to push the production structure in the opposite direction. Other indirect compensations for selling hard goods--such as aid extensions--are also possible, and are in effect being used.

Until now all the arguments in favor and against A-specialization tacitly assumed a closed Socialist market with no access to outside-the-block international trade. One possible partial solution to the relative scarcity of primary goods and the relative abundance of machinery in the block is to increase trade with the less developed countries in the world. This is done to some extent but it cannot solve the main food problems (grain, fodder, fresh produce, dairy products) except for the tropical varieties. This is probably what the Rumanians had in mind when they insisted, during the CMEA debates in the early 60's, on the inclusion of the Asian SOC within CMEA.[16]

The technological backwardness of much of MB and other industrial activities, even in the more developed SOC, seems to be the major factor preventing CMEA to solve its structural imbalance by way of trade with the West.[17] Moreover, it significantly worsens the situation. The failure of SOC to develop industrial products that are marketable in the West increased the pressure to market them inside the block as well as their pressure on the less developed members to abstain from 'parralel industrial development'. It deprived the block from hard currency income which could alleviate the shortage in primary goods. (In general there is nothing wrong for the entire socialist block to become a net exporter of manufactures and a net importer of A-products or primary goods.) On the other hand, this technology failure encouraged the

less developed SOC to seek for better and more advanced equipment in the West and pay for it with primary goods (A-originated included) thus adding a shrinkage of demand to excess supply for the first, and reduced supply to snowballing demand for the other.[18] Clearly the internal CMEA's price structure mentioned above only encourages such behavior. This situation clearly should have contributed to specialization in A-products (and other primary goods) either for trade purposes with the West, or to acquire a better bargaining position within CMEA.

So, with the one very important exception of the price structure within CMEA, the real economic conditions seem to be extremely favorable to specialization in A-products because of the Socialist growth strategy chosen and of other ideological and political considerations. To make this conclusion more realistic let us define what A-specialization really means here. The best way to our mind to look on the implied alternative growth strategy is to recognize the possible existence of a whole range of strategies (mixed if one wishes) between the two almost unrealistic extremes of intensive self-industrialization based on complete autarkic basis[19] on the one hand, and a very long specialization in agriculture with no or almost no self-industrial effort on the other. We take it for granted that industrialization is a must for modern growth and that an *eventual* development to a status of net importer of agricultural and other primary goods is also natural. The real question separates into three elements, only partly mutually dependent: the time intensity of the structural changes (of production and trade alike), the sequence of development of the various manufacturing industries, and the degree of dependence on trade. A few relevant variations of these three elements may be mentioned. To an almost completely autarkic industrialization

drive directed primarily towards heavy industry (the Soviet model) one may compare a strategy where the same goals--fast development of industrial self-sufficiency--is achieved by a very short period of intensive importation of machines and equipment paid for by surplus A-products accumulated for the purpose by various short-run ad-hoc methods (the model of at least some SOC during 1946-53, and Rumania during the late 50's and early 60's. This is the way Montias describes the industrialization process of these countries.)[20] Both models are different from a growth strategy that plans for a longer period of net exportation of A-goods and a somewhat slower industrialization drive. An essential part of such a strategy is the development of a solid long-range supply production capability in the A-sector.

If this last strategy is really better than the other two variants, it should show up in the overall per capita rate of growth, all other things being equal. Our hypothesis is that Bulgaria inside CMEA (and Yugoslavia outside it) have indeed chosen this path contrary to all other SOC. However, the proof of such an hypothesis, i.e., the identification of the policies as well as their consequences, is no simple matter. Many factors enter into the determination of the overall success of each economy, the particular variant of the growth strategy chosen, though important, is only one of them. Among the other factors, is the different degree of trade relations with the West. The relative disadvantage of a strategy of very rapid industrialization (as persued by Rumania) may be compensated for by the fact that this process is accomplished to a large extent with Western equipment; contrary to Bulgaria which may have chosen the other path but is persuing it to a much larger degree within CMEA. Even the identification of A-specialization policies may be hampered by the 'package deal' phenomenon described above which might force a country like

Bulgaria to produce machinery to go together with its inter-CMEA A-exports.

As shown above, persuing a Socialist growth strategy was bound to create a relative shortage of agricultural goods within a Socialist block. Likewise, the pragmatic selection of machine-building activities and the shying away from the equally prestigious raw material production resulted in a similar shortage of materials. Twenty years ago, and for a long period since, these goods where considered, with few exceptions, the underdogs of international trade. Only lately was it realized that the world is facing a period of general scarcity of food products and of many agricultural and non-agricultural raw materials--most notably energy sources. Local costs of production of many of these goods previously considered exorbitant (wheat, oil) look much more reasonable now, in the face of higher world market prices. The combined effect of the intra-SOC and international scarcity has forced SOC to mend their fences and to increase their efforts in the production of food and raw materials. Some results started to show up in the performance of agriculture during the second half of the 60's, those with respect to raw materials are only now beginning to bear fruit.

There are two consequences to our study: first the general SOC effort to compensate for past neglect in agriculture may blur the picture of a sole country directing special efforts towards its agriculture. Second, as it turned out, a country which may have suffered in the past from investing 'too much' in its raw-material production basis is now finding itself on top: the most orthodox Socialist growth strategy is now paying back. The potential gainers are of course the Soviet Union, Poland and Rumania. So in order not to obscure our main line of argument with consequences of recent world realities, we shall confine the study to the period 1950-70.

III. THE TRADE STRUCTURE OF SOC, AND DEVIATIONS FROM IT

Two main differences in the pattern of trade of SOC are emphasized in the literature. One is the autarkic phenomenon, i.e., the ratios of trade volumes to GNP in SOC are below 'normal' rates for market economies at comparable levels of development and size of population.[21] The second difference is in the commodity structure of SOC which is our main interest here.[22]

The 'normal' trade structure pattern of market economies, to be compared to that of SOC, is estimated by equations of the forms

1a. $$[E_i, I_i, F_i] = A + B(\ln Y) + D\ln N + u$$

1b. $$[E_i, I_i, F_i] = a + b(\ln Y) + c(\ln Y)^2 + d\ln N + u$$

where E_i, I_i, F_i, are the proportions of defined commodity groups in total exports, imports, and net trade (to be defined shortly) respectively. These proportions are to be explained by the level of economic development as measured by GNP per capita (Y) and by the country size as measured by the size of the population (N). The particular functional form, 1b., is taken from Chenery and Syrquin.[23] The main rational for the inclusion of two Y terms is to allow for enough decline in the rates of change as GNP per capita grows (and even a change in the sign of the Y coefficient) as indeed is observed in many processes of structural changes.[24] The commodity groups investigated here are: A--trade in agricultural and forestry products,[25] and M--machinery and transport equipment and armaments.[26] In addition some references are made to trade in total manufactures (non-A) and to non-machinery (other) manufactures (OM). The proportions of EA and EM are computed from total exports identified by commodity groups (and defined usually as f.o.b.) and IA and IM from total imports identified alike (and defined usually as c.i.f.).

FA and FM, the net trade proportions are defined as $F_i = RE_i - I_i$ where R is the ratio of total exports to total imports. Because of the different definitions of imports and exports the values of FA and FM are biased and these equations can only be used to show trends of change.

The normal sample is made up of 18 countries including most European countries, the United States, Canada and Japan. We have not included less developed countries in Asia and Africa in the sample since their GNP per capita and structure are completely out of the SOC range; we have not included any Latin American countries because of lack of data for some, and because of the very specific primary intensive export structure of others. Originally we have used two series of GNP per capita, one based on official exchange rates (Y_1) and the other on purchasing power parities (Y_2).[27] The results shown are based on the latter which generally give better estimates.

Equations were estimated for 1950, 1960 and 1970, first separately for each year and then by pulling all the observations together and by adding two dummy variables, D_{50} and D_{60}, to differentiate (by raising or lowering the functions) between each year's trade structure.

Some of the estimated equations are presented in Appendix Table A-1. Almost all of them have highly significant Y and N coefficients. Only for trade in machinery do the equations without $(\ln Y)^2$, (1a), give more significant Y coeffiecients than those of equation 1b so we added them to the table. The general results are the expected ones, namely: as the level of development rises the proportions of A-imports are rising and those of A-exports are falling/those bringing about a steeper fall in net A-exports. Trade proportions in machinery (and of course in industrial goods) are changing in exactly opposite directions to those in the A-trade. Also

according to well established international trade theory the larger the country the smaller the proportions of A-exports and net exports and the larger those of M.[28] On the basis of the above 'normal' pattern, the actual trade structure of SOC was compared to their trade structure as estimated from the equations. The results for three dates are shown in Table 1. These are residuals based on the normal equations (1b) for *individual* years, those derived from the integrated estimates are in most cases even larger (in absolute values.)[29] The data on the trade structure in SOC is based on CMEA's classification of commodities (CTN) which for the relevant categories dealt with here seem to be very similar to the SITC classification.[30] SOC data however is given f.o.b. for both imports and exports thus the SOC R values are usually higher. For this reason (and those mentioned above) we estimate SOC trade deviations from the deviations observed in the relevant export and import equations. GNP per capita for the SOC is made consistent with the two series used for the market economies.[31]

The results are presented in Table 1. In each case the SOC deviations can be compared with the standard error of estimate of the corresponding equation (column 8). Two concepts of 'specialization' are estimated in the table and the difference between them should be made clear at the outset: IA (or IM) or deviations from them (designated by ΔIA and ΔIM) measure the degree of specialization vis-à-vis all commodity groups including within the A (M) group, while FA (FM) is a specialization measure only vis-à-vis other commodity groups. If the interest is directed towards 'industrialization' and the relative size of the manufacturing vs agricultural sectors, the F concept of specialization is relevant. The E concept is relevant when policies toward agriculture and total economic performance are of interest. Here, of

course, we are interested in both. Still the F concept may conceal information about specialization even of its own concept: the same F can result from high or low volume of trade in the relevant commodity group.[32] Clearly one has to assign higher specialization marks to the first case. In the second, the relative impact of such specialization is very limited. One thus has to examine the F values in conjunction with those of E and I. The main results are as follows:

1. The proportions of A-exports (EA) are in almost all SOC and almost always below normal levels, in many instances by wide margins, especially for Czechoslovakia and East Germany (lines 2). Even traditionally heavy A-exporting countries like Poland, Rumania and Yugoslavia, are often found to be below the norm, and certainly not above it after 1950. Of all SOC, only Bulgaria shows a consistent positive EA deviation over the entire 1950-1970 period. It should be mentioned that since most other less developed SOC (Poland, Rumania and Yugoslavia) have a much larger population than Bulgaria, the normal level of EA estimated for them is lower at each level of GNP per capita than that of Bulgaria; the differences in actual EA proportions between Bulgaria and the other countries are thus much more extreme (compare lines 2 with lines 1).

2. Most of the time, most countries compensate for the low proportion of A-exports by low, sometimes even lower ones of A-imports (lines 4). As a general rule, and together with the findings of EA this demonstrates that SOC trade in A-goods is even lower than their participation in trade in general. Whatever the degree of relative autarky in SOC in general, the autarkic approach with respect to the A-sector is stricter. Especially, formerly A-exporting countries mentioned above apparently diverted their A-goods inwards and, to compensate, reduced imports drastically. (See the high/negative IA and EA deviations

of Hungary, Poland, Rumania, and Yugoslavia.) Although, in this respect, Bulgaria behaved similarly to the other SOC and also reduced its A-imports, it did so to a lesser degree than did Rumania, its peer in GNP per capita.

3. The deviations of the FA, net-export proportions, are usually either negative or, if positive, are based on negative deviations of both the EA and IA proportions. Czechoslovakia, East Germany, and in most years Hungary, have negative FA deviations,[33] while Poland, Rumania, Yugoslavia, and of course Bulgaria have positive ones. However, except for Bulgaria, these positive values are always (except for 1950) based on negative EA and IA deviations. Only in the case of Bulgaria which has the *highest FA deviations* among SOC is it based on positive ΔEA's and negative ΔIA's which are however lower (in absolute value) than similar deviations of Poland and especially of Rumania. So only in the case of Bulgaria can one talk about at least a semi-expansionist specialization in A-goods.

All these A-goods trade characteristics of SOC are diametrically opposed to the trade patterns of the East European countries prior to World War II when some of those countries constituted 'the granery of Europe'.[34]

4. SOC deviations in trade in machinery and equipment (M) (Part b, Table 1) are as expected: both the more developed SOC, which already by 1950 had positive EM deviations, and the less developed ones who started with very low EM proportions (and negative deviations) increased the proportions of EM over and above what is warranted by the growth in their GNP per capita levels thus creating positive EM deviations. They reached already by 1960 for Czechoslovakia, East Germany and Hungary, a few years later Poland and Bulgaria, magnitudes that are larger by several times than the

corresponding standard deviations. Bulgaria is again in a special position: starting from the lowest level of EM, it had by 1960 built-up a positive deviation equal to that of all other less developed SOC, by 1970 surpassed by far in EM *and* ΔEM both Rumania and Yugoslavia, and acquired a ΔEM figure equal to those of Hungary and Poland.[35]

5. Not as with respect to A-goods, SOC have higher than normal proportions of machinery imports. With few exceptions, Czechoslovakia and East Germany up to 1960, all countries have positive ΔIM figures no less than one standard deviation of the estimates, and in many cases much higher. This active trade clearly indicates a higher degree of general specialization in machinery. As to the particular specialization in M versus other commodity groups, we observe a pattern that begins (in 1950) with large net M-exports (lines 11 and 12) and large positive deviations for the developed SOC while the less developed SOC have large M-imports and large negative deviations. Over time, the number of SOC with positive FM deviations increases to include Hungary by 1960 (or before), and Poland and Bulgaria by 1970; only Rumania within CMEA and Yugoslavia outside remain with negative value of ΔFM. This pattern of change over time is similar to a normal trade and development process, but is moving much faster than warranted by the growth of GNP per capita; hence these large MF deviations--negative in the beginning and positive at the end.

6. By 1960, most SOC developed a negative deviation in net exports of other manufactures (including raw materials, semi-manufactures and light-non-food manufactures). Most of these deviations were eliminated by 1970, in a large part as a result of increasing net exports of light industrial goods (mostly in the more developed SOC), but also to some extent by renewed measures to reduce imports and increase exports of raw materials. This last trend comes

partly as a reaction to the developing scarcity of raw materials in the bloc and (for Rumania and Poland) partly represents their efforts to increase exports to the West. Here too Bulgaria stands apart as the only country that substantially increased its OM negative deviation between 1960 (or before) and 1970. This is explained by its ability to keep its M-exports at high levels on the one hand and by its large net exports of A, on the other.[36]

The specific SOC pattern of trade and the deviations of individual countries from it are better focussed on in the following analysis which tries to directly estimate a SOC pattern of trade. This is done by the estimation for the entire SOC and non-SOC groups of countries of the various trade equations with specific SOC variables added to the basic equations (1).

2.a,b. $[E_i\ I_i] = A + B\ln Y + (C(\ln Y)^2) + D\ln N + S + u$

3.a,b. $[E_i\ I_i] = a + b\ln Y + (C(\ln Y)^2) + d\ln N + S + b'S\ln Y + u$

where all the variables are like in equations 1, S is a dummy variable of 'being a SOC' and $S \cdot \ln Y$ is an interaction variable for SOC allowing for pattern of change of trade structure with respect to Y in SOC to change differently than in market economies. As for equations 1, many combinations of equations have been estimated. Tables 2 and 3 present results for versions b [that is including $C(\ln Y)^2$] of equations 2 and 3, respectively, with Y_2 series and with Yugoslavia excluded from SOC (Yugoslavia residuals are nevertheless presented). More specifically, in Table 3 we only show results for equations in which the coefficients of $S \cdot \ln Y$ were significantly different from zero (all in 1950, IA and EM in later years). The FA and FM proportions and residuals are then computed from the best version of the E and I equations (with or without $S \cdot \ln Y$).[37] All the results shown are from combined 1960, 1970

equations [with a dummy variable D_{60} for 1960 observations]. The results for 1950 are based on similar 1950 equations. The residuals for individual SOC are based on regressions in which those individual SOC participate as observations. This underestimates somewhat the magnitudes of the 'pure' residuals on regressions in which the investigated country does not participate.

The typical characteristics of trade of SOC are best seen in column 8 of Table 2 (and in the equations presented in Appendix Table 2). They are also shown in Figures 1 and 2 (forthcoming) where the SOC *deviations* from normal trade patterns, taken as the horizontal axis, are drawn:

1. SOC have lower proportions for both exports and imports of A-goods.

After 1950, the EA deficiency was larger than the IA one (that is both small and statistically nonsignificant) and as a result, a typical net import or negative specific specialization in A-goods developed. In 1950, while imports were well below normal, lower than in later years, exports were still heavily 'traditional' and above normal and all SOC were still characterized as net exporters of A-goods. Reparations, intensive industrial drives and austerity in the field of consumption all contributed to this situation for the early years.

2. As can be seen from the residuals in Table 2 and the equations in Table A-2 in the Appendix, the SOC trade deviation patterns are Y dependent. Thus in 1950 both EA and IA SOC deviations are income dependent: the developed countries are becoming heavy net importers of A-goods and the less developed (except Yugoslavia) are still net exporters (see the negative EA and positive IA SY coefficients for 1950). In later years the income dependency in the trade of A-goods is concentrated in imports (IA rising with income at higher rates than normal) and remains insignificant in exports, thus creating a

tendency of the negative FA deviations to also grow with income. This tendency reflects the growing shortage of A-goods in the more developed SOC. (See more on this below.)

3. SOC have significantly higher proportions of trade in machinery for exports, imports, and net exports.[38] The only exception being the less developed SOC which in 1950 already imported a lot of equipment but had not started yet to export them in significant amounts. In 1950 the deviations in both EM and IM were strongly income-dependent as implied by the above. In later years only deviations in machinery exports are income dependent, with less developed SOC exporting relatively less than the more developed members. This also creates a positive trend in SOC deviations in net exports.

4. SOC are net importers not only of A-goods but also of non-machinery industrial goods, non-A-raw materials included (OM). The net exports of industrial goods are equal by definition, and when imports = exports, to - FA and the net exports of non-machinery industrial goods: FOM = - FA - FM. From results for the S coefficients (Table 2, column 8) we can calculate FOM to be -5.7 points in 1950 and -2.9 points in 1960 and 1970. (Deviations from this normal socialist deficit are shown in line 7 of Table 3.) The deficit shown is most likely made up by positive net exports in consumer manufactures and a larger deficit in raw materials.[39]

5. Finally, the deviant trade structure of SOC seems to have been converging somewhat toward the normal pattern between 1960 and 1970. This can best be seen by observing that most individual SOC residuals of FA in 1960 are negative while those in 1970 are positive (Table 3, lines 3). The opposite is true with respect to FM (lines 6).[40]

The common SOC trade deviations have a number of dimensions: first, it

is less specialized (in the true meaning of the term) in A-goods and more so in M-goods / (and in manufacturing in general); second, SOC as a group show, within its specific deviant pattern of trade, what may look as a higher than normal level of A to M specialization between countries of different levels of GNP per capita (Table 3). Had they had normal trade levels (as percent of GNP) and had they have been trading among themselves, it would have indicated a high level of integration. As it is, both conditions are not met: the abnormal A to M specialization is a result of the suppression of trade in A-goods, and of the willingness of the Soviet Union to play the role of a less developed SOC--when it certainly is a developed one--and to import machines and export A-goods and raw materials.[41]

On the basis of *SOC normal* equations the peculiarities of Bulgaria's trade pattern stand out more clearly than when compared to the normal pattern: (Columns 6 in Tables 2 and 3):

1. Bulgaria is clearly outstanding as a consistent exporter and net exporter of A-goods in proportions much higher than other SOC. This is true even in 1950 when all SOC as a group exported larger than normal proportions of A-goods. Only then did any other SOC come close to it: Rumania as only a deviant *net* exporter (ΔFA) of A-goods, and even this because it reduced A-imports more drastically than did Bulgaria. In 1960 Bulgaria is the only country with positive EA and FA residuals (the latter only when $S \cdot \ln Y$ is included in the SOC equations). In 1970 when all EA and FA residuals are growing, Bulgaria's are also growing and are between 50 to 100 percent higher than any others. Only by 1970 (judging from Table 3) do both Rumania and Yugoslavia become small net exporters of A-goods but even then this is again due more to low A-imports than to high A-exports.

2. Bulgaria is much more in line with the rest of SOC in respect to the trade proportions of M. In all the years they are about normal, the sign of the deviation depends on whether one looks at Table 2 or 3. Only in 1970 does an important difference appear between Bulgaria on the one hand, and Rumania and Yugoslavia on the other: while Bulgaria manages to keep its machinery exports at normal Socialist levels, Rumania and Yugoslavia fall behind and develop relatively large negative exports and net exports deviations. In the case of Rumania, higher-than-normal M-imports residuals (even above the high SOC levels) also contribute to the M net exports negative deviation. The growing difference between Bulgaria and Rumania is a result of Rumania adopting a separatist policy since the late 50's, reducing its relative level of trade with CMEA, and turning more and more to the West.

3. By being a deviant net exporter of A-goods Bulgaria is of course also a deviant net importer of all industrial goods put together; since its M-trade is lately 'normal' by SOC standards (it was in deficit in 1960) all the abnormal deficit in trade in industrial goods is concentrated in non-machinery goods. The examination of the brakedown of its trade in industrial goods, other than machinery, seems to indicate that probably the entire deficit concentrates in materials and raw-materials and none of it in light industry.[42] The trade deficit in light industry, if it exists, is compensated by surplus in food industry and does not raise any serious problem. However, the trade deficit in raw-materials has recently become more serious, and may endanger Bulgaria's economic position, especially when compared with other less developed SOC having higher exports and smaller deficits in this category as Rumania, Poland and Yugoslavia (which is a net exporter of materials). This tendency, specific to Bulgaria and abnormal even by socialist standards, to concentrate

on M within heavy industry results in the first place from the poor natural endowment and thus the exorbitant price of the development of the country's raw material industries. But it may have resulted also from the nature of CMEA's trade mentioned above which ties together soft and hard goods in package deals: it may have encouraged Bulgaria to use the development of a hard-goods industry, like agriculture and processing industries, not only to help finance imports of machinery for industrialization purposes, but also as a bait that helps to advance sales of locally manufactured machinery. This is, in any case, the only way to realize the advantages of the A-exports, i.e., to compensate for the low prices received for them by higher prices paid for machinery.

IV. DIFFERENT AGRICULTURAL POLICIES AND PERFORMANCE IN BULGARIA

According to available comparative information on the performance of agriculture in the various East-European Socialist countries over the period 1950-70, Bulgaria stands apart and above as the country with the best record. This is true with respect to indexes of total output, of output per unit of land or per worker (or both), and with respect to the relative extent of investment and modernization measures. But, in the late 60's this top performance was upset: while most other SOC finally directed great efforts to improve their agricultural sectors, a relative retreat took place in Bulgaria. Recent records, however, seem to point to a renewal of past trends.

Over 1950-72 Bulgaria's agricultural output and gross and net product grew at the highest rates in East Europe. Output, for example, grew at 4.1 percent, compared with 3.8 percent in Yugoslavia, 3.4 percent in Rumania, and less than 3 percent in all other countries.[43] The difference is not that

dramatic but is still significant. (Over a period of 22 years the difference between a 4 and 3.5 percent annual growth rate accumulates to a total growth difference of about twenty percent.) This record is even more impressive if the last five years of that period are dropped, or if the base year is moved back to pre-war (World War II) normal levels. The comparatively best relative record was shown by Bulgaria between 1955-65, when its A-output grew at rates of 7.3 (1955-60) and 5.2 (1960-65) percent, with only Yugoslavia coming close in the first period. This is a very crucial period in our presentation as it comes when the big intra-CMEA debates on cooperation took place and just before all other SOC turned to rescue their own A-sectors. All the above statements are also true with respect to each of the two main subdivisions of agriculture: crops and animal products.[44]

A small relative increase in agricultural land vis-à-vis other SOC explains some of Bulgaria's record (Lazarcik 1974, p. 353); most of it however is explained by the almost fastest rates of growth in the block in product (output and gross or net product) per unit of land.[45] This is also true for crops and animal products separately. The highest rates of growth are found also in yields of grains, wheat, potatoes, sugarbeet, milk (per cow) and others.[46] Similar results are obtained for the 60' of the early 70'.[47] Lesser achievements by comparison to other SOC were obtained for meat and egg yields. Bulgaria's better achievements in terms of output per unit of land and yields can only in some cases be explained by relatively low initial levels. Already in the early 50's its output per unit of land was quite close to the average in the region (it surpassed it by 1970), and its crop output much above that average. In all these cases, as well as in that of animal output per unit of land--in which the initial relative level was indeed low--Bulgaria's initial

levels were still much higher than those of the other less developed SOC.[48]

When we turn to the other inputs in agriculture we find Bulgaria moving intensively, at the highest rates of change in East Europe in two opposing directions: it has the fastest decline of labor and, in most cases, the highest rates of growth of external inputs and investment. During 1950-72/ agricultural labor declined in Bulgaria at 3 percent per year. Similar rates of decline occurred only in the more developed SOC, while those in Poland (-0.1), Rumania and Yugoslavia (-1.8) were much lower.[49] This intensive exodus of inefficient labor was compensated for by the highest rates of growth of external inputs, (Lazarcik 1974, p. 339) and almost highest per unit of land (p. 360) and per worker (p. 372) and by the highest investment devoted to agriculture over the entire period (p. 378).[50] This makes the share of total productive capital devoted to agriculture (but that of Poland which seems odd),[51] and the rate of growth depreciation over 1950-72 the highest in the region (Lazarcik/ 1974, p. 339). Bulgaria's advances in the use of tractors (p. 335) and fertilizers (p. 337) are also very impressive probably the highest in the region for 1950 (or prewar) to 1970. Only during the last years other countries are advancing faster in these areas.[52] In any case, Bulgaria is using tractors and fertilizers at higher levels per unit of land than do Rumania and Yugoslavia and, in the case of tractors only, Poland.

All this amounts to a completely different economic policy toward agriculture in Bulgaria as compared to the labor-intensive capital-saving technology employed in all other SOC and especially the less developed among them; communist Bulgaria had apparently decided to change the input relations in its agriculture and to modernize it--at least relatively to the other SOC.

The results in terms of labor productivity in agriculture are clear: as

land per worker and commercial inputs and investment per worker were all growing at the fastest rates in the region (on land per worker, see Lazarcik 1974, p. 355) so did also output per worker: during 1950-72 output per worker increased at an annual rate of 7.2 percent in Bulgaria, with Hungary in second place with 5.8 percent. During 1960-70 Bulgaria's rate went up to 8.6 percent, by more than 3 points (60 percent!) above any other country (p. 371). Similar figures are obtained for gross and net product (p. 372). The Bulgarian superiority in this field is much more pronounced by the UN study that covers 1950-67. It estimates that the Bulgarian rates of growth of labor productivity were, for net output, more than two times higher than in any other East-European country.[53] While the labor productivity in Rumania and Yugoslavia stayed during 1950/55-1971/72 at about half and two-thirds, respectively, of the region's average level and that of Poland dropped from one and a half times the region's average down to the average, labor productivity in Bulgaria moved from about 70 percent to above the region's average (Lazarcik 1974, p. 373). This is a clear movement of a key indicator in the opposite direction to other less developed SOC, and as pointed out in the introduction may lie at the root of Bulgaria's relative superior performance.

Bulgaria's relative high labor productivity in agriculture is manifest not only vis-à-vis other agricultural sectors, but apparently also vis-à-vis other sectors in other SOC. This is seen from the fact that Bulgaria's ranking among SOC in its product share originated from agriculture is higher than the ranking of its share of labor engaged in agriculture. All the available series in both constant and current prices show that the share of agriculture (and forestry this time) in a total product measure of the national economy (GNP, NMP and the like), is largest in East Europe.[54] Without forestry it is

probably even larger. In terms of employment it moved from first place in 1950 to either third or fourth place depending on the source of the data.[55] This is another manifestation of the more 'modern' structure of the Bulgarian agriculture, especially as compared to the agricultiral sectors of Rumania, Yugoslavia and Poland.

The final productivity test however is that of output per unit of combined inputs or changes there of, figures that are very difficult to estimate. Using Alton's separate estimates for changes in labor and capital productivity for 1960-72 and sub-periods thereof, one may be able to make some reasonable guesses. Assuming that land does not contribute to *changes* in productivity and that capital and labor are weighted by 30 percent and 70 percent respectively, we get the following figures for total input productivity changes during 1960-72 and 1960-65:[56]

	1960-72	1960-65		1960-72	1960-65
Bulgaria	2.5	4.8	Hungary	2.3	5.1
Czechoslovakia	1.9	-3.4	Poland	0.3	0.5
East Germany	2.2	0.9	Rumania	1.7	0.3

Bulgaria comes out first in the 1960-72 and second in 1960-65 period. Our guess is that for 1950-72 the *relative* record of Bulgaria would have been even better.

The potential export capability of A-products may be roughly measured by the levels of production per capita of these products. The translation of potential into actual exports depends also on the efficiency of the procurement system, the degree of control and allowed level of own consumption, and the degree of development of the various processing industries that enhance the value-added of A-exports. With full collectivization and high levels of

concentration and centralization of the Bulgarian agriculture[57] (see more below) its procurement system should be at least as efficient as in other SOC. And there is no reason to assume that Bulgaria allows a more lavish self-consumption of A-products than its fellow SOC. Thus, as far as agricultural production is concerned, the potential export capability is translated to actual capability as measured by A-production per capita.

From the agricultural achievements listed above, it becomes clear that over 1950-72 Bulgaria also had the highest rates of growth of agricultural output per capita (Lazarcik/ 1974, pp. 348,349). Over that period Bulgaria's rate was 3.3 percent per annum (2.8 in crops and 4.1 in animal products). Yugoslavia comes second with 2.7 (2.4 and 3.0) and Rumania third with 2.3 (1.9 and 2.9). Those top rates of growth (they are still higher for 1950-67) helped Bulgaria to keep the relative level of its agricultural production above that in other SOC and even to incrase the gap.

In 1950-55 Bulgaria's A-output per capita which was a mere 2 percent above the region's average (potentially, judging by pre-war levels it was about 10 percent above the average), moved to more than 20 percent above average through 1966-70. At that time, only Hungary matched this level, while Rumania and Yugoslavia stayed below 90 percent of the average. Moreover, from 1950-55 to 1966-70, the latter two improved their relative position only very slightly, if at all.[58] All of Bulgaria's advantage in output per capita comes from its level of production of crops: 134 percent of the average in 1950-55 and 159 in 1966-70 (152 in 1971-72) which is, in both periods, far above second place Hungary. On the other hand, its initial relative level of animal products per capita was only 72 percent, just a trifle above the levels of Rumania and Yugoslavia; in this field too, in complete contrast to the other less developed

SOC, Bulgaria moved up to a level of 91 percent of the average, 10-20 points above Rumania and Yugoslavia. With Bulgaria's relative lower level of per capita income this level may be considered, by East-European standards, high enough to allow for net export of animal products, as indeed is the case.

If we assume that the Bulgarian people can be (or have been) brought to consume food and A-originated goods at average East-European production per capita levels of crops and at 75 percent of that level for animal products (which is still above the 1970 levels of Rumania and Yugoslavia), it may be able to net export about a third of its crop products and one sixth of its animal products. In this respect Bulgaria is distinctly different in level and past developments from the other less developed SOC, even including Poland which has much graver procurement problems since its agriculture is not collectivized and since its average A-product per capita has declined over time.

We shall not assume here the formidable task of relating A-exports to agricultural output: to make this connection one has to tackle problems of non-identical scope: (cotton is included in both categories, but textile products are not) that of the added value to agricultural products through processing, and, especially in East Europe, that of bridging between producer's costs and prices and trade prices. The examination of Bulgaria's production and trade trends makes it however very clear that the rate of growth of A-exports (and net exports) over 1950-70 by far outpaced the growth in agricultural production, that the growing potential surplus could cover only a small part of the increased net exports, and that the growth of the food processing industries and other light industrial users of A-products had to contribute much to increase the local value of these products.[59]

This is certainly the time for some qualifying remarks: while doing

somewhat better and differently than other East-European countries, at least until recently, Bulgaria of course has had its fair share of problems connected with running agriculture under communism. These problems range from consequences of forced collectivization, unprofitable state-farms, poor incentives, policies towards private plots, planning problems and frequent organizational changes, labor shortage, and the like.[60] In effect, the apparent slow down in the growth of agricultural output during the late sixties, seems to be connected with these problems, as well as with efforts to increase the production, and proportion, of meat and dairy products and of feed crops.[61] Until the mid 60's both the growing of many fruits and vegetables--the main Bulgarian exports--and the raising of livestock of all kinds were handled in large proportions by private or (mainly) semi-private activities within and outside the cooperatives. By then the Bulgarian authorities seem to have been convinced that modernization of agriculture, so necessary to keep production of exports and local supplies, can only be achieved by a new major centralization and 'industrialization' of agricultural production. Hence the move towards the creation of very large specialized agricultural-industrial units (agro-industrial complexes or later industrial-agricultural complexes) to deal with large-scale specialized production, processing and sales--directly for exports, which are sometimes processed from airfields belonging to the complexes.[62] This form of organization of agriculture on a large scale is the most advanced in East Europe.

While it is not clear if Bulgaria managed to overcome the problem of the transition period,[63] it is quite clear that it is Bulgaria's policy to see to it that the export of A-goods continues to play a major role in its exports and thus in its industrialization and growth. There seldom is an article

about agriculture that does not mention its relevance to exports. Exports needs are also considered a major justification for the organizational changes mentioned above. These are needed to bring Bulgarian agriculture to international standards, in terms of quality, supply punctuality and profitability.[64]

We have not yet searched the literature thoroughly for official and open declarations of policy of specialization in A-goods as a major means for economic development and industrialization. But whether such statements exist or not, the above evidence on actual behavior and policies, as well as Bulgaria's following CMEA's intensified efforts to increase the Socialist division of labor, and demands that Bulgaria specialize in A-goods, give a very clear picture.[65] This position is very clearly summarized by a Bulgarian economist in a relatively recent article which analyses the sources of growth of the Bulgarian economy. After demonstrating that Bulgaria is a very large importer and net importer of 'means of production' (as opposed to consumer goods) he argues that from those figures

> "... one can clearly see the great impact which foreign trade has had and will increasingly have on the process of expanded socialist production in Bulgaria.... Calculations... indicate that the production accumulation fund has obtained an additional from 30 to 36 percent through foreign trade elements.... Undoubtedly, this proves the great opportunities of foreign trade as a factor for the rapid effective development of the Bulgarian national economy."[66]

It may be interesting to note that neither here nor in any other place in the article, is there a mention of agricultural exports composing the bulk of the net exports of 'consumer goods', and there is no mention of A-goods specialization. The author must also tacitly assume but never puts it explicitly, that

the alternative of self-production is either impossible or much more expensive. The article concludes that the fastest rate of economic growth can be achieved by 'growing socialist economic integration' (Khazhiivanov, p. 39), which for Bulgaria must mean continued A-specialization.

V. TEMPORARY CONCLUDING OBSERVATIONS

Did Bulgaria have a different industrialization pattern than the other less developed SOC? To be sure, like all other SOC, Bulgaria put most of its effort into industrialization and succeeded together with Rumania, to achieve exceptionally high rates of growth of industrial production.[67] Starting from the lowest level in the block, Bulgaria still has a somewhat smaller industrial sector than other SOC (when the share is measured in current prices)[68] and a very close share to that of all SOC except Czechoslovakia and East Germany (when the shares are calculated on the basis of constant prices).[69] In contrast to agriculture, Bulgaria employs a higher share of its labor in industry than Rumania and Poland, another indication of the more balanced allocation of capital and labor among the different branches of the economy.[70] More important, however, is the internal structure of industry especially the sensitive balance between heavy industry (group A) and light, or consumer industry (group B). To be sure, like all other SOC, Bulgaria maintains a higher rate of growth in heavy industry than in light industry; but, starting (by 1950) from very unorthodox proportions, about 40 percent of total industrial output and less than a third of all employed in manufacturing.[71] Bulgaria had to try harder to close the gap, a task which is not yet accomplished. Still, in 1970 Bulgaria's 'group A' makes only 55 percent of industrial production--not only the lowest in the block but considerably so [compare with

shares of 70 percent in Rumania, 65 in Poland and Hungary, 62 in Czechoslovakia and 70 in the Soviet Union and East Germany]. The proportion is still going up, by 1974 it reached 58.3 percent, but has yet a long way to go, to reach the 'typical' socialist proportion of somewhere between 65 and 75 percent.[72] The same is true with respect to the proportion of labor force employed in heavy industry: Bulgaria is the only country in the block with a proportion of less than 50 percent.[73] While having more ground to cover, Bulgaria seems to have taken it with a longer breath. And this is the main conclusion: while it is not clear where Bulgaria will stop shifting towards more heavy industry--it may well aim at what is considered as healthy proportions or it may stop short--it is very clear that for Bulgaria this has been a long-range plan making use of its comparative advantage in agricultural goods to a larger degree than others. To accomplish this, under the unfavorable conditions of underdeveloped and collectivized agriculture, a somewhat different approach towards agriculture was needed and undertaken.

Did this strategy pay off? As was stated in Section II, many factors contribute to a final outcome translated in the rate of growth of GNP or GNP per capita. Even in the narrow sphere of the industrialization strategy and the economic approach towards CMEA, the Soviet Union and the West, there are a number of factors that are not essentially connected to the industrialization strategy--like aid from the Soviet Union (from which Bulgaria benefited more), the benefits of opening up to the West in the spheres of technology, the effects of market competition (from which Rumania and Yugoslavia benefited more), or changes in the internal economic system as in Yugoslavia. Still by final (Western) count, Yugoslavia has the highest rate of growth of GNP per capita, Bulgaria comes second, and Rumania third, all three at rates significantly

higher than in the more developed SOC.[74] Yugoslavia, and by some estimates also Bulgaria, surpassed Poland, and Bulgaria apparently got in front of Rumania.[75] Beyond the common explanation that less developed countries tend to grow faster, it is not possible to give differential marks. It seems, however, safe to assume that within a socialist system, Bulgaria at least did not do something very wrong. It is quite certain that the alternative of concentrating more efforts in heavy industry, especially in developing its own raw material base on the account of agriculture, all other things being equal, would have brought out less favorable results. A similar argument, also in a counterfactual context is brought up by Perkins for China.[76] A higher rate of investment in and growth of agriculture could have raised exports and hence imports of equipment, thus allowing for a higher rate of growth of the entire economy.

But even if there are positive results one does not see (except possibly as compared with the alternative) any extraordinary gains for Bulgaria as one could expect from the theoretical case made for A-specialization. It is up to further study to determine the causes: was not the policy being carried out strongly enough? Is there a non-surpassable contradiction between agriculture under communism and its efficiency? or are the arguments that there is a lot to be gained by such a policy pushed too far?

Peter Wiles portrays the modern successful imperialist as providing both guns and butter to its clients.[77] I am not sure how far a country like Bulgaria (or the other less developed SOC) can go offering tomatoes with one hand and sunplowers with the other. It seems however that for the time being this is at least a sound economic policy.

Table 1: Trade Structure of Socialist Countries and Deviations from 'Normal' Structure of Market Economies (Equations 1b): 1950-1970

				Czechoslovakia (1)	East Germany[a] (2)	Hungary (3)	Poland (4)	Bulgaria (5)	Rumania (6)	Yugoslavia[b] (7)	SD (8)
a. Trade in A-goods											
(1)	1950	EA	Act.	15.4	6.8	38.6	28.1	88.0	54.7	54.5	
(2)			Δ	-19.2	-22.8	-4.8	1.2	24.3	9.7	4.5	17.4
(3)		IA	Act.	60.7	33.0	41.7	31.9	13.9	22.4	41.3	
(4)			Δ	13.0	-22.1	-3.8	-26.6	-20.6	-25.5	-3.9	7.4
(5)		FA	Act.	-43.6	-27.2	-7.4	-5.2	63.5	25.2	-15.7	
(6)			Δ	-34.3	2.5	-0.5	27.7	42.0	33.9	6.0	(17.7)
(1)	1960	EA	Act.	10.4	5.9	27.4	23.0	56.4	35.9	45.3	
(2)			Δ	-17.7	-19.0	-8.4	-3.3	5.7	-4.2	-0.6	14.6
(3)		IA	Act.	37.1	39.2	29.2	33.9	16.7	18.4	26.4	
(4)			Δ	6.1	5.2	-2.5	-6.0	-11.4	-16.5	-7.3	6.0
(5)		FA	Act.	-26.0	-33.2	-4.0	-13.4	34.6	21.5	1.7	
(6)			Δ	-24.9	-24.4	-5.2	3.1	16.6	11.8	6.9	(18.1)
(1)	1970	EA	Act.	7.3	7.4	26.7	15.9	43.4	26.8	25.7	
(2)			Δ	-13.8	-13.5	-3.6	-11.3	7.2	-6.2	-1.6	10.6
(3)		IA	Act.	24.1	28.1	24.4	21.4	15.9	15.4	16.5	
(4)			Δ	0.6	2.3	0.2	-7.7	-6.3	-10.3	-10.9	2.3
(5)		FA	Act.	-16.6	-21.7	0.7	-5.8	31.4	9.8	1.6	
(6)			Δ	-14.8	-15.1	-4.1	-3.4	14.1	4.5	10.0	(9.1)

Table 1: (cont'd.) *Trade Structure of Socialist Countries and Deviations from 'Normal' Structure of Market Economies (Equations 1b): 1950-1970*

				Czechoslovakia (1)	East Germany[a] (2)	Hungary (3)	Poland (4)	Bulgaria (5)	Rumania (6)	Yugoslavia[b] (7)	SD (8)
b. Trade in Machinery											
(7)	1950	EM	Act.	20.3	28.0	20.7	7.8	0.0	4.2	1.6	
(8)			Δ	6.1	15.3	13.3	-5.0	0.4	-1.5	-2.4	6.6
(9)		IM	Act.	0.7	5.5	17.4	32.4	37.2	37.1	31.8	
(10)			Δ	10.5	-3.3	4.2	24.8	18.2	24.1	17.4	4.9
(11)		FM	Act.	15.3	18.6	1.0	-25.0	-37.2	-33.5	-31.1	
(12)			Δ	-4.4	16.5	7.6	-29.6	-17.8	-25.4	-18.5	(9.3)
(7)	1960	EM	Act.	45.7	49.0	38.6	28.3	12.9	16.7	16.5	
(8)			Δ	23.9	26.5	24.8	8.9	7.5	5.0	7.6	7.9
(9)		IM	Act.	21.7	12.7	28.5	27.1	43.9	33.6	35.9	
(10)			Δ	0.2	-6.8	4.5	9.7	14.5	10.3	10.7	6.4
(11)		FM	Act.	26.7	36.8	7.0	-1.9	-32.2	-15.1	-25.7	
(12)			Δ	25.1	33.6	18.3	-1.8	-7.8	-4.8	-6.0	(12.5)
(7)	1970	EM	Act.	50.4	51.7	32.6	38.5	29.0	22.8	22.7	
(8)			Δ	24.1	26.1	16.5	17.6	17.4	6.7	2.9	6.3
(9)		IM	Act.	33.4	34.2	30.9	36.2	40.6	40.3	33.3	
(10)			Δ	13.0	15.9	9.3	15.4	14.8	15.2	13.1	9.6
(11)		FM	Act.	18.5	14.9	-0.3	1.5	-9.0	-18.9	-20.1	
(12)			Δ	11.8	8.9	6.2	1.8	4.2	-8.9	-11.4	(12.0)

Table 1: (cont'd.) *Trade Structure of Socialist Countries and Deviations from 'Normal' Structure of Market Economies (Equations 1b): 1950-1970*

			Czechoslovakia (1)	East-Germany[a] (2)	Hungary (3)	Poland (4)	Bulgaria (5)	Rumania (6)	Yugoslavia[b] (7)	SD (8)
c. Net Trade in Other Manufacturing (FOM)										
(13)	1950	Actual	39.3	-5.4	-4.7	25.2	-38.3	-4.7	-6.2	..
(14)		Δ	38.7	-19.0	-7.1	1.9	-24.2	-8.5	12.5	..
(15)	1960	Actual	5.3	-2.6	-11.0	4.3	-11.4	4.6	-14.0	..
(16)		Δ	-0.2	-9.2	-13.1	-1.3	-8.8	-7.0	-0.9	..
(17)	1970	Actual	1.1	1.8	-6.4	2.3	-13.4	3.1	-23.5	..
(18)		Δ	3.0	6.2	-2.1	1.6	-18.3	4.4	1.4	..

Table 1: Notes and Sources

General note: EA and IA and FA (REA - IA) are the proportions of exports and imports and net exports of agricultural originated goods; EM IM and FM are corresponding proportions of trade in machinery and FOM (= - FA - FM) is the proportion of net exports of other, non-machinery manufacturing goods. The exact definitions are given in Appendix Table 2. The deviations for E_i and I_i are from regressions presented in Appendix Table 1, equations 1b. The F_i deviations for each country are computed from the E_i and I_i deviations according to the formula $F_i = RE_i - I_i$ where R is the ratio of total exports to total imports for each country. SD in Column (8) is the standard deviation of the estimate of the above equation, SD. Figures in parenthesis are from FM equations in Appendix Table 1.

a/ In 1950, EA, IA and FA do not include trade in 'raw materials' of vegetable and animal origin. With these inclusions, I assume, FA will be negative.

b/ Based on SITC classification and on exports f.o.b. and imports c.i.f. as contrasted with f.o.b. f.o.b. for the other Socialist countries. The exceptionally small R of Yugoslavia (even by market economy standards) causes some peculiar results especially with respect to FOM (part C.).

Sources: See sources to Appendix Tables 1 and 2.

Table 2: Deviations of Trade Structure of Socialist Countries from Normal Socialist Trade Pattern (Equation 2b)

			Czechos-lovakia (1)	East Germany[a] (2)	Hungary (3)	Poland (4)	Bulgaria (5)	Rumania (6)	Yugoslavia[b] (7)	S (8)	SD (9)
(1)	1950	ΔEA	-14.6	-18.8	-2.4	4.7	21.7	9.4	2.2	-2.4 -0.3	17.1
(2)		ΔIA	25.5	-8.4	10.0	-12.3	-4.9	-16.0	9.9	-13.7 -2.6	10.2
(3)		ΔFA	-41.7	-7.8	-12.1	16.8	24.0	24.2	-8.9	11.3	..
(4)		ΔEM	0.7	10.1	8.3	-9.9	-3.5	5.7	-5.0	4.7 1.3	7.1
(5)		ΔIM	-13.0	-13.1	6.0	14.5	5.5	12.1	3.8	10.3 2.5	7.9
(6)		ΔFM	13.8	21.8	1.4	-23.9	-8.6	-7.1	-6.2	-5.6	..
(1)	1960	ΔEA	-8.9	-13.0	-4.7	-2.9	10.8	-1.6	2.2	-9.6 -2.1	12.4
(2)		ΔIA	8.0	8.3	1.9	0.8	-6.2	-9.8	0.1	-2.3 -1.0	5.8
(3)		ΔFA	-17.4	-21.4	-6.2	-3.4	16.0	8.0	1.3	-7.3	..
(4)		ΔEM	5.7	9.5	9.9	-5.1	-7.0	-9.0	-5.0	18.2 6.6	7.4
(5)		ΔIM	-5.6	-13.6	-3.0	-0.7	5.7	-0.3	-0.5	8.0 2.5	8.4
(6)		ΔFM	11.6	23.2	12.1	-3.8	-12.1	-9.7	-2.6	10.2	..
(1)	1970	ΔEA	-6.7	-5.5	5.7	2.0	17.7	7.2	8.6	9.6 2.1	12.4
(2)		ΔIA	5.0	6.7	4.0	-6.1	-3.5	-9.1	-7.3	-2.3 -1.0	5.8
(3)		ΔFA	-11.9	-11.9	1.4	8.1	22.8	15.9	12.3	-7.3	..
(4)		ΔEM	6.1	8.0	-2.4	-1.2	-1.9	-12.5	-13.9	18.2 6.6	7.4
(5)		ΔIM	-0.8	1.8	-3.2	6.8	4.8	8.2	2.0	8.0 2.5	8.4
(6)		ΔFM	7.1	5.8	0.9	-8.0	-6.9	-20.0	-10.1	10.2	..

Table 2: Notes and Sources

General note: For the definitions of the variables, see general note to Table 1. The deviations of E_i and I_i of individual SOC are from regressions based on equations 2a as presented in Appendix Table 2 and in which the socialist countries, except Yugoslavia (see note b, below) participated as observations. The FA and FM deviations are computed on the basis of the E_i and I_i deviations using the formula $F_i = RE_i - I_i$.

The SOC coefficients given in column (8) are the general SOC vertical deviations of all socialist countries as a group from the normal-market economy line (equations 2a); SD (column 9) are the standard deviations of the estimates of the relevant equations. Figures in small numerals are the t values of the coefficients.

a/ See note a in Table 1.

b/ See note b in Table 1. The deviations of Yugoslavia are derived from equations similar to those described above, only that Yugoslavia's observations are also included in the regressions.

Source: See sources to Appendix Tables 1 and 2.

Table 3: Deviations of Trade Structure of Socialist Countries from Normal Socialist Trade Pattern (Equations 2b, 3b)

			Equat. used (0)	Czechoslovakia (1)	East Germany[a] (2)	Hungary (3)	Poland (4)	Bulgaria (5)	Rumania (6)	Yugoslavia[b] (7)	SD (8)
(1)	1950	ΔEA	3b	6.7	-12.9	-1.7	5.3	5.6	-3.1	-9.1	15.8
(2)		ΔIA	3b	9.9	-12.7	9.4	-12.7	6.9	-0.8	16.3	8.7
(3)		ΔFA		-2.5	1.6	-10.9	17.7	-2.0	-1.9	-20.6	..
(4)		ΔEM	3b	-4.1	8.8	8.1	-10.1	0.1	-2.9	-1.7	7.0
(5)		ΔIM	3b	0.6	-9.3	-5.6	14.9	-4.8	4.1	-3.9	6.4
(6)		ΔFM		-5.2	16.7	12.8	-24.5	4.9	-6.6	3.1	..
(7)		ΔFOM		7.7	-18.3	-1.9	6.8	-2.9	8.5	17.5	..
(1)	1960	ΔEA	2b	-8.9	-13.0	-4.7	-2.9	10.8	-1.6	2.2	12.4
(2)		ΔIA	3b	3.6	5.5	4.5	4.8	-1.1	-3.1	5.8	5.2
(3)		ΔFA		-13.0	-18.6	-8.8	-7.4	10.9	1.3	-4.4	..
(4)		ΔEM	3b	1.2	6.6	12.5	-1.1	-0.0	-2.3	1.5	6.9
(5)		ΔIM	2b	-5.6	-13.6	-3.0	-0.7	5.7	-0.3	-0.5	8.4
(6)		ΔFM		6.9	20.3	14.5	-0.3	-5.7	-2.3	1.4	..
(7)		ΔFOM		6.1	-1.7	-5.7	7.7	-5.2	1.0	3.0	...
(1)	1970	ΔEA	2b	-6.7	-5.5	5.7	2.0	17.7	7.2	8.6	12.4
(2)		ΔIA	3b	-3.2	0.3	2.6	-5.3	-2.7	-7.4	-7.9	5.2
(3)		ΔFA		-3.7	-5.5	2.8	7.3	22.0	14.2	12.9	..
(4)		ΔEM	3b	-2.4	1.5	-3.8	-0.5	-1.0	-10.8	-14.7	6.9
(5)		ΔIM	2b	-0.8	1.8	-3.2	6.8	4.8	8.2	2.0	8.4
(6)		ΔFM		-1.7	-0.4	-0.4	-7.3	-5.9	-18.4	-10.5	..
(7)		ΔFOM		5.4	5.9	-2.4	0.0	-16.1	4.2	-2.4	..

Table 3: Notes and Sources

General note: The definitions are as in Table 1 (see general note), and the deviations are estimated in the same manner as in Table 2, only that here the E_i and I_i deviations are estimated from the *best equations* between 2a and 2b in each case (Column 0). The equations are presented in Appendix Table 2. SD (Column 8) are standard deviations of estimates of the relevant equations.

a/ See note a, Table 1.

b/ See note b, Table 2.

APPENDIX

Table A-1: Trade Structure and Economic Development: Regression Results for 18 Market Economies

Year	Trade variable	Constant (1)	$\ln Y_2$ (2)	$(\ln Y_2)^2$ (3)	$\ln N$ (4)	R^2 (5)
1950	EA	1129.75 2.55	-312.46 -2.32	23.16 2.27	-16.50 -4.38	0.63
	EM	-201.72 -1.20	51.27 1.00	-3.17 -0.82	5.31 3.71	0.70
	EM	-65.16 -3.90	9.56 3.97		5.02 3.67	0.68
	IA	-716.60 -3.83	225.70 3.96	-17.36 -4.01	13.08 8.20	0.85
	IM	365.43 2.97	-102.75 -2.74	7.75 2.73	-5.59 -5.33	0.70
	FA	1797.62 3.99	-541.95 -3.96	41.41 3.99	-21.13 -5.52	0.75
	FM	-425.85 -1.80	109.59 1.52	-7.51 -1.37	11.05 5.48	0.75
1960	EA	1599.42 2.82	-434.32 -2.63	30.59 2.55	-11.57 -3.83	0.63
	EM	-517.15 -1.68	137.55 1.54	-9.06 -1.39	6.91 4.22	0.72
	EM	-91.17 -3.60	13.13 3.67		6.27 3.87	0.68
	IA	-542.56 -2.31	165.31 2.42	-12.28 -2.47	7.77 6.21	0.74
	IM	606.70 2.45	-162.23 -2.25	11.59 2.21	-6.93 -5.24	0.69
	FA	1533.46 2.56	-447.24 -2.57	33.07 2.61	-14.02 -4.39	0.61
	FM	-775.61 -1.64	194.45 1.41	-12.84 -1.28	14.75 5.83	0.78

Table A-1: (cont'd.) *Trade Structure and Economic Development: Regression Results for 18 Market Economies*

Year	Trade variable	Constant	$\ln Y_2$	$(\ln Y_2)^2$	$\ln N$	R^2
		(1)	(2)	(3)	(4)	(5)
1970	EA	1274.73 1.79	-322.25 -1.66	20.99 1.59	-6.45 -2.95	0.58
	EM	-335.73 -0.85	81.65 0.71	-4.43 -0.57	6.79 5.25	0.83
	EM	-118.15 -4.83	16.72 5.09		6.58 5.43	0.82
	IA	-897.92 -4.51	253.74 4.67	-17.68 -4.77	5.07 8.26	0.85
	IM	1843.61 2.87	-496.25 -2.83	33.91 2.84	-3.56 -1.80	0.40
	FA	1569.62 2.58	-431.56 -2.60	29.92 2.65	-9.05 -4.83	0.65
	FM	-2020.84 -2.52	523.19 2.39	-34.32 -2.30	11.23 4.55	0.73

Table A-2: Trade Structure Pattern of Socialist and Market Economies [Regressions Based on Equations 2b and 3b]

	Coefficients	Constant	$\ln Y_2$	$(\ln Y_2)^2$	lnN	SOC	S · Y	D_{60}	R^2
1950	EA	1405.67 3.44	-392.65 3.14	29.00 3.05	-17.5 -4.89	-2.39 -0.3			0.65
	EA	1176.61 3.00	-326.60 -2.74	24.24 2.68	-16.80 -5.06	259.77 2.04	-41.64 -2.06		0.72
	IA	-791.49 3.26	246.42 3.32	-18.74 3.31	12.53 5.88	-13.66 -2.56			0.71
	IA	-623.37 -2.87	197.95 3.00	-15.25 -3.04	12.00 6.53	-206.08 -2.92	30.56 2.73		0.80
	EM	-264.12 -1.57	69.68 1.36	-4.51 -1.15	5.20 3.53	4.71 1.27			0.64
	EM	-212.29 -1.21	54.73 1.03	-3.43 -0.85	5.04 3.40	-54.61 -0.96	9.42 1.04		0.66
	IM	484.81 2.57	-137.13 -2.38	10.19 2.32	-5.48 -3.31	10.29 2.48			0.56
	IM	337.93 2.13	-94.78 -1.96	7.14 1.95	-5.01 -3.73	178.39 3.46	-26.70 -3.27		0.73

Table A-2: Trade Structure Pattern of Socialist and Market Economies [Regressions Based on Equations 2b and 3b]

	Coefficients	Constant	$\ln Y_2$	$(\ln Y_2)^2$	lnN	SOC	S • Y	D_{60}	R^2
1960-70	EA	917.66 3.13	-228.84 -2.75	15.03 2.54	-8.63 -4.95	-9.56 -2.05		2.78 0.69	0.59
	EA	844.58 2.81	-209.24 -2.46	13.73 2.28	-8.63 -4.95	72.30 0.95	-11.78 -1.08	2.05 0.50	0.60
	IA	-487.47 -3.50	140.04 3.61	-10.06 -3.66	5.99 7.36	-2.26 -1.04		7.52 4.02	0.67
	IA	-382.40 -3.05	114.28 3.22	-8.35 -3.33	5.98 8.23	-109.89 -3.47	15.49 3.40	8.48 5.00	0.74
	EM	-287.36 -1.65	64.66 1.31	-3.37 -0.96	6.42 6.20	18.25 6.60		0.64 0.27	0.77
	EM	-189.57 -1.13	38.43 0.81	-1.62 -0.48	6.42 6.61	-91.31 -2.16	15.77 2.59	1.62 0.71	0.80
	IM	675.29 3.42	-177.89 -3.17	12.39 3.12	-4.69 -3.99	7.99 2.55		-5.38 -1.99	0.45
	IM	640.28 3.15	-168.50 -2.92	11.77 2.89	-4.69 -3.97	47.21 0.92	-5.64 -0.76	-5.73 -2.08	0.46

Tables A-1 and A-2: Notes and Sources

General Notes: (a) Definition of terms: Y--GNP per capita; N--Population (mid-year) based on purchasing power parities; E--Proportion in total exports; and I--Proportion in total imports. EA, IA--Goods originated in agriculture and forestry: for market economies and Yugoslavia including revised SITC Categories 0, 1, 2 *less* 27, 28 and 4; for Socialist countries including CTN Categories, 5, 6, 7, 8 [Paul Marer, *Soviet and East European Foreign Trade 1946-1969* (Bloomington Indiana and London: Indiana University Press, 1972), pp. 324-325, and 312, 318.] EM, IM--Machinery, transportation equipment and armaments: Revised SITC Categories, 7, 95; CTN Category 1. Inconsistencies between SITC and CTN for the above categories are mainly due to the exclusion of household appliances in SOC from machinery production, and some ambiguity about the inclusion of armaments in the available SOC statistics in Category 1 (see John M. Montias, "The Structure of Comecon Trade and the Prospects for East-West Exchanges," in *JEC-74*, pp. 662-668. The exclusion of household appliances biases downwards SOC trade in M and possible SOC M exports.

FA, FM are the proportions of net exports in total imports and are computed as

$$F_i = RE_i - I_i \quad \text{where} \quad R \text{ is } \frac{\text{exports}}{\text{imports}}.$$

Another inconsistency between market economies (and Yugoslavia) and SOC arises from the fact that the former trade data is mostly f.o.b. for imports and c.i.f. for exports while SOC data is mostly f.o.b. which makes R systematically higher for SOC. For this reason F deviations for individual SOC are calculated on the basis of E and I equations.

(b) The market-economies samples includes 18 countries; all European countries with the exception of Switzerland, Turkey, the U.S., Canada and Japan. SOC include all East-European countries except Albania (for lack of data), the USSR

Tables A-1 and A-2: Notes and Sources (cont'd.)

(because of its large size there is no meaning to estimates of normal trade pattern for it) and Yugoslavia.

Sources: *GNP per capita*--1960: based on Abram Bergson's worksheets [explained in detail in Abram Bergson, "Development Under Two Systems: Comparative Productivity Growth Since 1950," *World Politics*, XIII (No. 4, July 1971), pp. 611-13.] Estimates for Spain and Finland were made on the basis of U.N., *Yearbook of National Accounts Statistics*. Other years: Market economies and Yugoslavia: U.N., *Yearbook of National Accounts Statistics, op. cit.* Based on growth of rates for GNP per capita given in various years; Socialist countries: based on growth rates given by Thad P. Alton, "Economic Growth and Resource Allocation in Eastern Europe," in *JEC-74*, p. 270 (all Y_2 data are expressed in U.S. dollars 1964).

Population--Market economies and Yugoslavia: U.N., *Demographic Yearbook*, various years; International Bank for Reconstruction and Development, *World Tables 1971;* and statistical yearbooks of individual countries. *SOC:* Paul F. Myers, "Population and Labor Force in Eastern Europe: 1950 to 1966," in *JEC-74*, p. 424.

Trade data--Market economies and Yugoslavia: U.N., *Yearbook of International Trade Statistics*, various years; *SOC:* 1950, 1960, Marer 1972, *op. cit.*, pp. 45-59; 1960, 1970, Council for Mutual Economic Assistance, *Statistical Yearbook* (Moscow: 1975), pp. 327-32.

NOTES

[1] Gur Ofer, "Industrial Structure, Urbanization and the Growth Strategy of Socialist Countries," *Quarterly Journal of Economics* XC: 219-44 (May 1976); Gur Ofer, "Economizing on Urbanization in Socialist Contries: Historical Necessity of Socialist Strategy," in *Internal Migration--A Comparative Perspective*, edited by Alan A. Brown and Egon Neuberger (forthcoming).

[2] Input substitution is clearly not the *only* reason for the observed low *relative* total productivity in SOC agricultural sectors. It is however an important one. Low relative productivity tends to further increase the share of labor (and other inputs) employed in this sector.

[3] Ofer 1976, *op. cit.*, pp. 242-43.

[4] See for example, Michael Kaser, *Comecon--Integration Problems of the Planned Economies* (London: Oxford University Press, 1967), pp. 105-106.

[5] The term ideology is used here in its broader meaning to encompass all aspects of a Socialist economic system.

[6] On the conflict, see Alan A. Brown, "Towards a Theory of Centrally Planned Foreign Trade," in *International Trade and Central Planning*, edited by Alan A. Brown and Egon Neuberger (Berkeley and Los Angeles: University of California Press, 1968), pp. 75-77. On A-exports financing imports of machinery, see especially John M. Montias, "Socialist Industrialization and Trade in Machinery Products--An Analysis based on the Experience of Bulgaria, Poland, and Rumania," in Brown and Neuberger 1968, *op. cit.*, pp. 130-65; and John M. Montias, *Economic Development in Communist Rumania* (Cambridge, Mass.: The MIT Press, 1967, pp. 182-86, 234ff.

[7] See more on this below.

[8] So difficult in fact that it is generally believed that only after the elimination of differences (in levels of production but presumably also in structure) among SOC can the 'Socialist division of labor' flourish. It cannot easily be used to effect this equalization. See J. Novazamski, "The Development of the International Division of Labour between Countries at Different Economic Levels," in *Economic Development for Eastern Europe*, edited by Michael Kaser (London: Macmillan, 1968), pp. 148-49.

[9] See Sandor Ausch, *Theory and Practice of CMEA Cooperation* (Budapest: Akademiai Kiado, 1972), pp. 44-45; John P. Hardt, "East European Economic Development: Two Decades of Interrelationships and Interactions With the the Soviet Union," in *JEC-70*, p. 10; Paul Marer, "Soviet Economic Policy in Eastern Europe, in *JEC-74*, p. 154; and Nicolas Spulber, *The State and Economic Development in Eastern Europe* (New York: Random House, 1966), p. 45.

[10] Marer 1974, *op. cit.*, p. 154; Zbigniew M. Fallenbuchl: "Comecon Integration," *Problems of Communism* XXII: 25-29 (March-April 1973), p. 32; "East European Integration: Comecon," in *JEC-74*, pp. 84-87. See also Ausch 1972, *op. cit.*, pp. 41-45 and Spulber 1966, *op. cit.*, pp. 45-46.

[11] From a net importer of raw materials from CMEA during 1949-51, the Soviet Union became, by the late 60's, a very large net exporter of such materials. The trend in net exports of A-products is in the opposite direction: based on Paul Marer, *Soviet and East European Foreign Trade 1946-1969* (Bloomington, Indiana and London: Indiana University Press, 1972), pp. 87, 111; for later years, see Soviet Union, Ministerstvo Vneshney Torgovli SSSR, *Vneshnyaya Torgovlya SSSR za 1974 god.* The Foreign Trade of the USSR for 1974), p. 21.

[12] Marer 1974, *op. cit.*, pp. 151-54 (also pp. 138-41); Peter J. Wiles, Foreign Trade of Eastern Europe: A Summary Appraisal," in Brown and Neuberger 1968, *op. cit.*, p. 170; Hardt 1970, *op. cit.*, pp. 9-10.

[13] See for example, Alan A. Brown and Paul Marer, "Foreign Trade in the East European Reforms," in *Plan and Market-Economic Reform in Eastern Europe*, edited by Morris Bornstein (New Haven and London: Yale University Press, 1973), pp. 190-91. On other consequences of the technological failure, see below.

[14] See Ausch 1972, *op. cit.*, p. 85 ff, pp. 100-101; Marer, 1974, *op. cit.*, pp. 147-50; Edward A. Hewett, *Foreign Trade Prices in the Council for Mutual Economic Assistance* (London, Cambridge University Press, 1974), chapters 2,3 and pp. 160-62.

[15] See for example, Ausch 1972, *op. cit.*, pp. 97, 111 ff; Montias 1967, *op. cit.*, pp. 243-44.

[16] Kaser 1967, *op. cit.*, pp. 94-96.

[17] This failure though partly unexpected by the designers of the Socialist growth strategy is a direct result of the extensive nature of the industrialization drive and the total neglect of light-consumer industries in which some of the developed SOC were quite advanced already before World War II.

[18] See for example, Montias 1967, *op. cit.*, pp. 234-47; Wiles 1968,*op. cit.*, pp. 163-74; Fallenbuchl 1973, *op. cit.*, pp. 34-35.

[19] And even becoming very fast a net exporter status of manufacturers and net importer of primary goods.

[20] Montias 1967, *op. cit.*, chapters 3, 4, 5. See especially pp. 243-44. Montias seems to imply (pp. 244-245) that Poland in the past (pre 1967)

and Bulgaria and Rumania in the future, may exhaust their potential to export hard goods too early.

[21] See Frederic L. Pryor, *The Communist Foreign Trade System* (London: George Allen and Unwin Ltd, 1963), pp. 23-28 especially Tables 1-2 p. 27; Ausch 1972, *op. cit.*, p. 37 and notes to Table 3; Maurice Ernst, "Post-War Economic Growth in Eastern Europe--A Comparison with Western Europe," in *JEC-66*, Table 18, p. 900.

[22] It is indeed the product (multiplication) of the two that makes up the effects and differential effects of trade or the industrial structure, but problems in evaluating the first prevent us at this moment from incorporating the total effect in the analysis.

[23] H. Chenery and M. Syrquin, *Patterns of Development, 1950-1970* (London: Oxford University Press, 1975), pp. 16-18. See also Figure 1 (forthcoming).

[24] Equations without $(\ln Y)^2$ were also estimated and are used whenever they give significantly better results.

[25] Categories 0, 1, 2, 4 *less* 27 and 28 of Revised SITC.

[26] Categories 7 and 95 of Revised SITC.

[27] For details and sources see notes to Appendix Tables 1 and 2.

[28] More can be said on the results but not for our immediate use. Any other relevant point shall be made in conjunction with the discussion on the trade structure of SOC below.

[29] The residuals based on equations without $(\ln Y)^2$ (1a) are also usually larger. They are also not presented here.

[30] The A-proportions are composed by CTN categories, 5, 6, 7, 8 and the M-proportions by Category 1. For the comparison of the various trade classifications, see Marer 1972, *op. cit.*, pp. 5-11, 309-41.

[31] See details in the notes to Appendix Tables 1 and 2.

[32] If $\Delta EA = 20$ and $\Delta IA = 10$ then (with $R = 1$) $\Delta FA = 10$ as it is also if $\Delta EA = -10$ and $\Delta IA = -20$.

[33] On biases see notes a and b to Table 1.

[34] Gur Ofer, *Industrial Structure, Urbanization and Socialist Growth Strategy: An Historical Analysis--1940-1967* (Jerusalem: The Hebrew University, 1974), pp. 18-25 and citations there; Spulber 1966, *op. cit.*, pp. 78-79; Alfred Zauberman, *Industrial Progress in Poland, Czechoslovakia, and East Germany 1937-1962* (London: Oxford University Press, 1964), pp. 294-96.

[35] Bulgaria's small size contributes to a lower normal or expected level of EM than those of other less developed SOC. Compare, for example, EM and ΔEM for Bulgaria and Rumania.

[36] Underlying data on the breakdown of OM into its components is from Marer 1972, *op. cit.*, pp. 44-67.

[37] Thus FA residuals for both 1960 and 1970 are computed from IA equations with $S \cdot \ln Y$ and EA equations without it. The opposite holds for the FM residuals.

[38] Montias has shown similar results using a similar method of analysis. See John M. Montias, "The Structure of Comecon Trade and the Prospects for East-West Exchanges," in *JEC-74*, pp. 679-80.

[39] Observations based on trade structure data in Marer 1972, *op. cit.*, pp. 44-79 and CMEA-75, *op. cit.*, pp. 327-33.

[40] We have now estimated this shift explicitly, by introducing to the estimating equations a specific SOC time shifting variable: $S \cdot D_2$. The results are as claimed above and shall be incorporated in the final version of the paper.

41 Soviet trade structure with European CMEA countries is as follows:

	EA	IA	FA	EM	IM	FM
1959-61	33.6	11.8	24.2	14.6	46.1	-30.5
1968	22.4	11.4	10.1	25.2	49.2	-25.0

Soviet net exports of raw materials to European CMEA are 30.3 and 35.0 percent for the two periods respectively. Based on Marer, *op. cit.*, pp. 87, 111. See also Fallenbuchl 1973, *op. cit.*, pp. 33-34.

42 As a net import of 22.4 percent (of total imports) in 1960 and 23.7 in 1970 Bulgaria has the highest such deficit among SOC. On the other hand, Bulgaria's net exports of light industrial goods of 8.7 percent in 1960 and 10.3 in 1970 are quite normal if not slightly above (by SOC standards). The underlying data is from Council for Mutual Economic Assistance (CMEA) *Statistical Yearbook* (Moscow: 1975), pp. 327, 330).

43 Most of the data presented here is from Gregor Lazarcik, "Agricultural Output and Productivity in Eastern Europe and Some Comparisons With the U.S.S.R. and U.S.A.," in *JEC-74*, pp. 328-93. Output growth data is on pp. 337, 339. Lazarcik's definition of Agriculture excludes Forestry and Fishery, so does most of the evidence presented here. In forestry products, Bulgaria is a net importer, increasingly so over time.

44 These findings are also supported by a comparative study of East Europe prepared for the United Nations. U.N., Economic Commission for Europe, *Economic Survey of Europe 1969* (Geneva: 1970), chapter 2, pp. 1-53 (henceforth ECE-69). The data presented here is for 1950-67, pp. 12-13.

45 Lazarcik 1974, *op. cit.*, pp. 358, 360. Only Yugoslavia had higher growth rates for input per unit of land.

46 *Ibid.*, pp. 363, 365.

47 CMEA-75, *op. cit.*, pp. 190-96.

[48] Lazarcik, 1974, pp. 362, 363.

[49] *Ibid.*, p. 367. See also ECE-69, *op. cit.*, p. 17 for 1950-67. The acceleration of the movement out of agriculture in the late sixties may indeed be one of the causes for the slowdown in growth. See Bogoslav Dobrin, *Bulgarian Economic Development Since World War II* (New York: Praeger Publishers, 1973), pp. 57-58.

[50] See also Alton 1974, *op. cit.*, pp. 280, 281 and Ofer 1976, *op. cit.*, pp. 235-240.

[51] Alton 1974, *op. cit.*, p. 267.

[52] Lazarcik's use of 1953-57 as base obscures the fact that by that time Bulgaria had advanced in these fields more than other SOC.

[53] ECE-69, *op. cit.*, p. 21. See similar results for 1960-72 in Alton 1974, *op. cit.*, p. 279.

[54] See Alton 1974, *op. cit.*, pp. 256-57; ECE-69, *op. cit.*, pp. 11-12, 16; CMEA-75, *op. cit.*, pp. 42-43.

[55] Alton 1974, *op. cit.*, p. 263; ECE-69, *op. cit.*, p. 18, CMEA-75, *op. cit.*, pp. 393-96. Since East European national accounts have a bias towards labor, I suspect that the Bulgarian A-share is relatively underestimated.

[56] Based on Alton 1974, *op. cit.*, pp. 279, 281.

[57] Bulgarian collective farms are the largest in East Europe. See J. Wilczynski, *Technology in Comecon* (London: The Macmillan Press Ltd., 1974), p. 211.

[58] Lazarcik 1974, *op. cit.*, p. 351.

[59] Bulgaria's total exports grew at an annual rate of about 17 percent, that of A-goods at about 13 percent over 1950-1970. The corresponding figures for 1955-70 and 1960-70 are 17.5 and 15.5 percent for total exports and

15 and 12.5 for exports of A-goods. The growth of A-goods exports can only be explained by a simultaneous increase of its processed proportion: it grew from 76 percent to 84 percent in 1970. Presumably, the 'depth' of processing grew even more. Based on Bulgaria, *Statisticheski Godishnik na Naroda Republika B'lgaria, 1971* (Statistical Yearbook of the Bulgarian Republic), pp. 312-14.

60 See for example, Dobrin 1973, *op. cit.*, pp. 43-65, 87.

61 There is conflicting evidence about whether or not the growth of agricultural output of Bulgaria actually slowed down during the late sixties. While Lazarcik gives figures of 1.0 percent (p. 337) per year for 1965-70, the official Bulgarian figure is 4.4 percent as compared with 4.1 percent during 1960-65 (Bulgarian Statistical Yearbook, 1971, *op. cit.*, p. 190). Lazarcik's 1960-65 figure is 5.2 percent. The differences may lie in different periodization and of course in different weights.

62 Dobrin 1973, *op. cit.*, pp. 62-65; Wilczinski 1974, *op. cit.*, pp. 219-25. Examples from Bulgarian sources: U.S., Joint Publication Research Service, *Translations on Eastern Europe Economic and Industrial Affairs*, No. 394: 15-29 (December 12, 1970); No. 397: 27-34 (January 1, 1971); No. 412: 1-7 (February 2, 1971). (JPRS-Bulgaria). Bulgaria has between two and four times more planes serving Agriculture than any other SOC (except of course, the USSR). See Wilczinsky 1974, *op. cit.*, p. 213. See also *Radio Free Europe Research* (February 8, 1974).

63 For evidence that Bulgarian agricultural production is picking up, see Lazarcik 1974, *op. cit.*, pp. 337, 348, 372.

64 See sources in note 62 above. See also *JPRS-Bulgaria*, No. 290: 32-38 (May 18, 1970) and Vladimir Radoykov, "Economic Regulation of the Relations

between Industry and Agriculture," *Eastern Europe Economics:* 132-51 (Winter 70-71).

65 See Pryor 1963, *op. cit.*, pp. 40-41; Kaser 1967, *op. cit.*, pp. 105-106; and Montias 1967, *op. cit.*, pp. 196, 198, 205. On Bulgaria's general support of CMEA integration see also Henry W. Schaefer, *Comecon and the Politics of Integration* (New York: Praeger Publisher, 1972), pp. 30-32, 72-73, 124-25, 180-81.

66 Ivan Khadzhiivanov, "High Social Labor Productivity--High Effectiveness of the National Economy," [Vunshna Turgoviya: 2-10 (No. 9, 1974)] as translated in *JPRS-Bulgaria:* 23-41 (No. 1224, January 20, 1975). The citation is on pp. 31-32. See also pp. 37-38, 39.

67 Edwin M. Snell, "Economic Efficiency in Eastern Europe, in *JEC-70,* p. 243; Alton 1974, *op. cit.*, pp. 274, 275. Lately Rumania is clearly taking the lead.

68 ECE-69, *op. cit.*, p. 16.

69 Alton 1974, *op. cit.*, pp. 256-57.

70 ECE-69, *op. cit.*, p. 18, Alton 1974, *op. cit.*, p. 263.

71 CMEA-75, *op. cit.*, p. 66. Similar data is presented by Fallenbuchl 1973, *op. cit.*, p. 67. Distribution of employment is from Alton 1974, *op. cit.*, p. 265.

72 The level reached by most other SOC and the USSR, CMEA-75, *op. cit.*, p. 66.

73 Alton 1974, *op. cit.*, p. 265.

74 *Ibid.*, p. 270; Thad P. Alton, "Economic Structure and Growth in Eastern Europe," in *JEC-70,* p. 50.

75 Alton 1974, *op. cit.*, pp. 268, 270.

[76] Dwight H. Perkins, "The International Impact on Chinese Central Planning," in Brown and Neuberger 1968, *op. cit.*, pp. 186-98, especially pp. 193-94, 198.

[77] Wiles 1968, *op. cit.*, pp. 172-73.

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