WPS 0937

How Soft
is the Budget Constraint
for Yugoslav Firms?

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Despite the virtual absence of direct government subsidies to firms, and the existence of open unemployment, Yugoslav firms were subjected to massive, pervasive redistribution through a soft budget constraint. Yugoslavia's channels of redistribution differed significantly from those in other socialist economies, but the redistribution shared a common 〈 ..ng force — the pursuite of job and wage security.

Do Yugoslavia's channels and pattern of "soft budget" redistribution differ from those documented for other Eastern European economies? After all, Yugoslavia's self-management system has been regarded as a "third way," a system fundamentally different from those of other socialist economies. The workers' roles as decisionmakers and as claimants of firms' residual income are inconsistent with the concept of state paternalism implied in soft budget redistribution.

Kraft and Vodopivec show that Yugoslav firms have also been subjected to massive, pervasive redistribution through a soft budget constraint; in 1986, gross subsidies in manufacturing amounted to 50 percent, and net subsidies to 15.6 percent of GDP. In a new approach to quantifying such redistribution, Kraft and Vodopivec focus particularly on the redistribution flows produced by holding financial assets and liabilities in an inflationary environment in which financial claims are generally not indexed. Analyzing firm-level data for Yugoslavia's entire manufacturing sector for 1986 show that such flows — in contrast with those of other Eastern European economies — have been a far more important source of redistribution than formal taxes and subsidies. Although

Yugoslavia's channels of redistribution differ significantly from those in other socialist economies, the redistribution shares a common driving force — the pursuit of job and wage security. Producers of energy, food, and heavy manufactures, as well as less developed regions, have especially benefited from the redistribution.

This analysis for Yugoslavia suggests an important lesson for the process of transition in Eastern European economies. As the economy decentralizes (with decisionmaking shifting to local governments and enterprises), powerful coalitions emerge that represent special interests, and many new channels of redistribution may open. Where multiparty democracy is still developing and property rights are ill designed, decentralization may thus increase, not decrease, redistribution.

The authors question the appropriateness of many analyses of, and conclusions drawn from, the "Yugoslav experiment." Most studies of the Yugoslav economy take for granted that any residual surplus of a firm accrues to those who currently work for the firm. But evidence that income is massively redistributed among firms casts doubts on the validity of such an assumption and thus on the results of studies based on it.

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Massive redistribution of income has been a key feature of East European socialism. Most evident is the subsidization of consumption, especially basic food and housing, but more subtle and pervasive redistribution results from the phenc ienon of the so-called soft budget constraint, with profitable firms being discretionally taxed and the proceeds used to bail out unprofitable ones.[1] Janos Kornai (1980) and others have written about the consequences of such redistribution: allocative inefficiency, poor product quality, and poor motivation for workers.

The channels and pattern of soft budget redistribution detailed for Hungary (Kornai and Matits 1987) and Poland (Schaffer 1990a) may be extrapolated to other Eastern European economies, but not as obviously to Yugoslavia. Yugoslavia's self-management system has been regarded as a third way, a system fundamentally different from that of other socialist economies. Yugoslav workers' roles as decisionmakers and claimants of firms' residual income is inconsistent with the concept of state paternalism implied in soft-budget redistribution. Moreover, Yugoslavia has experienced significant open unemployment since the 1970s, an indication that the budget constraint on the Yugoslav firm might not have been soft enough to absorb excess labor supply, or may not have been soft at all.[2] Finally, the studies of Poland and Hungary show direct government subsidies to have been the vehicle for softening the firms' budget constraint; such subsidies have been virtually nonexistent in the Yugoslav economy for more than two decades.

The purpose of this paper is to show that Yugoslav firms have also been subjected to massive, pervasive redistribution through a soft budget constraint. To quantify such redistribution, we focus particularly on the redistributive effects of holding financial assets and liabilities in an inflationary environment in which financial claims are generally not indexed.

1/   Bailouts are uncommon in market democracies, but these societies are not
       spared from counterproductive redistribution, above all stemming from
       the collusive behavior of producers and bargaining among distributive
       coalitions. See, for example, Olson 1982.

2/   Open unemployment could also be explained by labor-management
       interpretation of the Yugoslav firm, according to which insiders, as the
       claimants of residual income, block the entry of outsiders.

Analyzing firm-level data for Yugoslavia's manufacturing sector for 1986, we show that such flows, in contrast to those of other Eastern European economies, have been a far more important source of redistribution than taxes and subsidies. Although Yugoslavia's channels of redistribution differ significantly from those in other socialist economies, they share a common driving force: the pursuit of job and wage security. Producers of energy, food, and heavy manufactures, as well as less developed regions, have particularly benefitted from the redistribution.

1. CHANNELS OF REDISTRIBUTION

To prevent social unrest, personal earnings policies in Yugoslavia during the 1970s and 1980s ensured job and wage security by leveling out differences in average earnings among enterprises. Average earnings were leveled through a mechanism designed to control the distribution of the firm's income. By determining the "socially warranted" wage-bill, that part of income the workers could take home, the mechanism restrained above-average enterprises from paying high earnings and allowed below-average enterprises to pay personal earnings regardless of their ability to finance the wage-bill. A firm with income 60 percent above the industry average, for example, could pay only 25 percent above the industry average in personal earnings, and a firm with income 40 percent below the industry average could pay only 19 percent below the industry average in personal earnings (Vodopivec 1989).

By compressing differences in personal earnings across firms, the control of income distribution allowed income to be shifted from above-average to below-average firms. Basing pay on calculations of the socially warranted wage bill meant that, after wages were paid, proportionally more income was left in above-average than in below-average firms. Income could then be shifted from above-average to below-average firms, and was indeed drained away through the many channels described below. Below-average firms that exhausted their income by paying out an excessive share of personal earnings relative to

their earnings were subsidized by being exempted from taxes and similar payments and allowed concessionary credits.

To do justice to an analysis of redistribution in the Yugoslav economy, we must consider several nonstandard types of tax and subsidy. Formal taxes and subsidies are only the tip of the iceberg. Significant redistribution takes a less visible form in the appropriation of financial savings by means of an inflation tax and in compulsory financial investments with large stipulated negative returns.[3] Overall taxes thus consist of formal taxes, quasitaxes, and losses on money, while overall subsidies consist of formal subsidies, quasisubsidies, and gains on money. These taxes and subsidies are described below; see Appendix 1 for their precise definition in terms of accounting data.

1.1 Formal taxes and formal subsidies

Formal taxes and formal subsidies are pure income transfers, formally recognized as such. Formal taxes include republican income taxes, some other obligations that have the nature of taxes, such as expenses for preserving the environment and payments for social self-defense, and payments for the provision of social services to the Self-Management Communities of Interest (SMCIs).[4] Formal subsidies are nonreimbursable resources obtained to prevent or lessen a loss reported in the annual income statement, or to help when such a loss has been incurred. At least part of formal subsidies can be used to finance personal incomes. Sources of subsidies are other firms within the Working Organization of Associated Labor (WOAL) and government reserve and

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3/ Yugoslavia has traditionally been plagued by inflation. Inflation rose from about 30 percent in 1980 to full hyperinflation by the end of 1989.

4/ Self-Management Communities of Interest (SMCIs) are independent legal entities, managed jointly by producers and consumers, that provide goods and services in areas where markets alone fail to do so: services, energy and infrastructure.

solidarity funds (Law of Associated Labor, Article 155).[5] Also, some forms of interfirm crediting, called resource pooling because the creditors supposedly retain decision-making power over the resources lent, specify that the creditor must help the debtor cover losses, should they occur.[6]

1.2 Quasitaxes and quasisubsidies

Quasitaxes and quasisubsidies are also income transfers but, unlike taxes and subsidies, are not formally recognized as such. We define quasitaxes as complete or nearly complete appropriations of resources by one agent that are formally accounted for as financial investments by another agent. That is, the resources appear on the asset side of the investor's balance sheet, but are typically written off after some time, perhaps several years.[7] To a much lesser extent, they are repaid to the investor, but only at their face value or at a small positive nominal interest rate with a grace period of several years, which means, with inflation, at a substantially negative real interest rate so that in real terms, only a minute portion of the original investment is recovered.[8] Both sides clearly understand the grant implicit in this kind of financial investment, so these investments are clearly involuntary. Quasisubsidies are the counterparts of quasitaxes.

5/ The Working Organization of Associated Labor (WOAL) is considered to be Yugoslavia's closest counterpart to the Western enterprise. It usually consists of several sub-units called Basic Organizations of Associated Labor (BOALs).

6/ The opposite case, participating in the debtor's profits, rarely yields positive real gains, since principal is usually not revalued and payment of the profit share in Yugoslavia's highly inflationary environment normally does not even make up for the loss of the principal.

7/ Enterprises are advised by government to accept self-management agreements to that effect. These agreements are supposed to serve as a veil preserving the legality and integrity of the system despite the involuntary and discretionary nature of the transfers.

8/ For example, the loan to the Federal Fund for the Acceleration of the Development of Less Developed Republics and Provinces is repaid in 13 annuities, after a grace period of three years and with an interest rate of 5 percent (The Use of the Account Plan for an OAL, *Information on Book-Keeping and Profession*, 1985.)

The channels for this type of transfer are as follows:

- Credits to cover losses.

- Rehabilitation credits.

- Resource pooling

- Investments in development funds, special government funds, securities, or SMCIs of material production.[9]

- Investment in a WOAL's solidarity and reserve funds.

- Foreign loans to enterprises from commercial banks, to the extent that the enterprises are relieved from exchange rate risk.[10]

- Waivers of taxes, contributions, and compulsory pooling of resources.

- Borrowing from the firm's own business fund to cover the loss; lossmakers are, to some extent, entitled to do so.[11]

Most of these channels are used only selectively. If a firm is unable to meet its obligations without incurring a loss, the obligations are reduced, deferred, or simply waived. Lossmakers, and some other firms, as determined by law, are thus exempted from, partly relieved of, or allowed to defer the obligation (a) to pay taxes to the republican government, (b) to contribute to republican reserve and solidarity funds, and (c) to pool resources in the Federal Fund for Financing Less Developed Regions and SMCIs of material production.

9/ These include natural monopolies such as electricity, oil and gas, infrastructure including railroads, roads, ports, airports, and some utilities such as broadcasting, telephone, mail. They finance part of their investment through direct "contributions" from firms in other industries.

10/ Until recently, this was true in Yugoslavia. Authorities allowed exchange rate differences stemming from this type of loan (the effects of revaluating foreign loans denominated in dinars as a result of the depreciation of domestic currency) to be deferred and thus to be shown on enterprises' balance sheets as an increase in assets (under "active deferrals"). Thus, they would not appear among costs when they were due, so only the original counterpart of a loan in dinars was translated into costs -- creating large excess demand (see World Bank 1989).

11/ The firm is obliged to repay these funds in the future, but at least the "gain-on-money" clause applies (that is, with inflation the firm repays to its business fund less in real terms than it borrows from it).

A word about the enterprises' ability to pay. The income-sharing nature of personal incomes in Yugoslavia makes labor costs, at least theoretically, very flexible. If external obliga 'ons and capital accumulation were given priority, and the firm's personal income fund were treated as a residual, most enterprises would indeed be able to meet their obligations. Of course, the residual left for personal incomes might be small, even dropping below the level needed to provide a minimum standard of living. To avoid such a socially undesirable situation, priority is given to personal earnings, and capital accumulation and other obligations are considered residual. The quasi-fixed nature of personal earnings determines the amount of residual income and thus the firm's ability to meet its obligations.

1.3 Losses and gains on money

Quasitaxes and quasisubisdies derive from inflationary taxation of compulsorily allocated resources. Another redistribution, losses and gains on money, results from inflationary taxation of voluntarily allocated resources. Losses on money are defined as an inflation tax on voluntarily held money assets (assets whose values are firmly fixed in the money unit, such as cash, debts owned by the firm, and loans given to other firms) (see Baxter 1984, 58-78). Obviously, gains on money are the reverse image of losses on money. Given Yugoslavia's historical practice of holding the interest rate significantly below the inflation rate, borrowers accrue significant gains on money and lenders accrue losses. So the banking system has been a significant source of redistribution from net creditors to net debtors.[12]

In the empirical analysis that follows, these channels of redistribution are quantified from the accounting data. But other important channels of redistribution (not easily quantifiable, if at all) are omitted from the analysis. The most important channels unaccounted for are:

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[12] Thus, the Yugoslav economy has been seriously financially "repressed," to borrow McKinnon's terminology (for example, McKinnon 1991).

(a)   Implicit taxation through regulated prices.[13]

(b)   Redistribution through accounting methods: A firm's financial results

also "depend" on the accountants' ability to bend rules and come up with

a "positive zero" (a barely positive result on the income statement), to

avoid paying taxes and quasitaxes. This is particularly important in

Yugoslavia, where accounting rules do not allow for inflation, and where

no independent auditing companies restrict firms' discretion in applying

rules.[14]

(c)   Eating up a firm's own capital through "depreciation of all assets in

real terms through improper or inadequate operation of the enterprise"

(Vanek 1972).

2. REDISTRIBUTION FLOWS QUANTIFIED

In this section, we quantify the flow of redistribution for Yugoslav

manufacturing, both nationally and by region and industry.

The empirical analysis is based on 1986 annual accounts of all (8,689)

Yugoslav manufacturing enterprises. See Appendix 2 for the description of

data. The year 1986 was chosen because data were available for it. In

judging how generalizable the results are for the rest of the 1980s, two

considerations are particularly important. First, everything else being

equal, redistribution flows deriving from the inflation tax are proportional

to inflation. Inflation was steadily rising in the 1980s, see footnote 3, so,

on this count, the results overestimate redistribution flows before 1986 and

underestimate them after 1986. Second, in response to mounting inflation, new

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13/   Petrovic (1988) suggests that the Yugoslav price system is not much
       more distorted than that of some market economies. He finds that prices
       in market economies are generally within 10 percent of equilibrium
       values, in Yugoslavia 13 percent, and in Poland and the Soviet Union
       about 30 percent.

14/   The treatment of inventories is especially deficient. As one empirical
       study shows, because of the widespread use of the FIFO accounting
       method, material costs have been understated and income overstated, thus
       allowing higher wage increases and adding to pressures on inflation
       (Lavrac and Cibej 1986).

accounting rules were introduced in 1987 and again in 1989 to limit
redistribution. It is doubtful, however, that the new rules were effective
(Mates 1989).[15]

2.1 How flows are calculated

Formal taxes and subsidies are calculated as the sum of appropriate
flows taken mostly from the income statement. For quasitaxes, quasisubsidies,
and losses and gains on money, the following method is used. Since debts in
Yugoslavia were typically not indexed in 1986, redistribution flows deriving
from holding assets (liabilities) were proportional to both inflation rate and
the average amount of asset (liabilities) held. The redistribution flow,
RFLOW, where RFLOW could be each of the above variables, is thus calculated as

$$RFLOW = INFLR \times \frac{B_{-1} + B_0}{2} \qquad (1)$$

where INFLR is an inflation rate, equal to 84 percent for Yugoslavia in 1986
based on the retail price index, and B_{-1} and B_0 are the tax (subsidy) bases at
the end of the previous and current years, respectively. Note that the
redistribution flows are expressed in terms of the money units at the end of
the period, and that the equilibrium real interest rate is assumed to equal
zero. The tax (subsidy) base is the sum of the items described for various
categories (see Appendix 1).

In calculating losses on money, the amount calculated using this formula
is reduced by the sum of interest payments received and the amount of joint
income received by participants in resource pooling. Similarly, in
calculating gains on money, the amount calculated using this formula is

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15/   It would be of great interest to trace changes in redistribution through
       time, in response not only to changes in inflation and accounting rules,
       but also to the changes in economic and political system their ultimate,
       fundamental determinant. Such a study seems a fruitful avenue for
       future research.

reduced by the sum of interest payments paid by the enterprise and income paid to other enterprises as a dividend from resource pooling.[16]

2.2 Redistribution for the economy as a whole

Table 1 shows redistribution for Yugoslav manufacturing for 1986 (see Appendix 2 for description of data). The variables are defined as rates that is, as a percentage of the firm's income.[17] In calculating the rates, we corrected for differences in valuation between redistribution flows (end-of-the-year valuation) and income (mid-year valuation) by inflating income by the retail price increase during June and December 1986.[18]

Table 1: REDISTRIBUTION IN YUGOSLAV MANUFACTURING IN 1986

Variable[a]	Mean[b]/ (in percentage)	Coefficient of variation
Formal taxes	14	2.07
Formal subsidies	1	74.67
Quasitaxes	25	8.17
Quasisubsidies	13	28.03
Losses on money	88	8.63
Gains on money	132	18.03
Net subsidies[c]/	18	37.88

a/ Variables are defined as rates, that is, the firms' redistributive flows as a percentage of the firms' income.
b/ Income-weighted mean.
c/ Defined as the difference between the sum of subsidy rates and the sum of tax rates.

16/ Generally in the 1980s the discrepancy between the inflation rate and the dinar depreciation rate was insignificant, but this was not true in 1986. In 1986, even money liabilities (assets) denominated in foreign exchange could bring gains (losses) on money. But this type of gain (loss) is atypical and unpredictable, so it has been ignored.

17/ The firm's income corresponds to the firm's net value added—it is the difference between the firms' revenues and costs. Costs include depreciation, but not wages.

18/ Mid-year valuation of income assumes that prices in 1986 were increasing linearly, and that firms' revenues and costs were distributed equally over the year. We are grateful to Neven Mates for pointing out to us the problem of differences in the evaluation of redistributive flows and income.

Table 1 substantiates our claim that formal taxes and subsidies constitute only a minor component of redistribution; indeed, formal subsidies are a negligible one percent of income. Much more sizable are quasitaxes, quasisubsidies, and especially gains and losses on money.

Redistributive rates vary substantially. Most enterprises receive no formal subsidies since these are distributed to the lossmakers, and some of whom receive heavy subsidies, so formal subsidies vary much more than any other redistributive flow. Other subsidies, quasisubsidies and gains on money, also vary greatly, more than any tax variables. Subsidies are obviously directed more narrowly, and thus distributed more discretionally, than taxes, although formal taxes vary significantly enough to suggest that they are also discretionary.

Total gross subsidies in manufacturing amounted to a staggering 58 percent of income or 50 percent of GDP.[19] Manufacturing was, admittedly, one of the most heavily subsidized sectors, but the Yugoslav economy as a whole was probably one of the most heavily subsidized Eastern European economies. Schaffer (1990b) estimates direct Polish subsidies to be 14 percent of GDP, for example, and reports that Gomulka estimates subsidies arising from soft credits to be of a similar order of magnitude. Needless to say, both Yugoslav and Polish subsidies substantially exceed those in Western Europe, which range from 1.3 to 6 percent of GDP (European Community 1989).

Looking now at the net effect of redistribution, the sum of subsidies minus the sum of taxes, as reflected in the variable net subsidy in table 1, the manufacturing sector as a whole turns out to be a net beneficiary of redistribution. Net subsidies amount to 18 percent of income or 15.6 percent of GDP; money gains alone, in fact, exceed the sum of all three components of taxes. This is certainly a sizable transfer: we estimate pre-tax profits to be 43 percent of income, so net subsidies add on 42 percent to profits.[20]

That the manufacturing sector is a net beneficiary of redistribution is surprising. For one thing, enterprises in Yugoslavia are taxed quite heavily, partly because many social services in Yugoslavia are financed from enterprise taxes. Moreover, manufacturing's share in total Gross Material Product in 1986 was 43 percent, so the question arises, where did subsidy resources come from. In particular, if one assumes that other sectors besides manufacturing were subsidized.

19/ Because of the inherent interdependence between money losses and money gains, we only consider net money gains in calculating gross subsidies.

20/ No definition of profits existed in Yugoslav accounting in 1986. Pre-tax profits are defined here as income minus wage payments. This corresponds to the Yugoslav notion of surplus of production (visak proizvodnje).

Two facts are important in explaining the source of the subsidies. First, private businesses, as well as sectors in which prices were not controlled, were net taxpayers. Second, and more important, as several studies point out, in the 1980s, Yugoslavia's commercial banks ran significant deficits that later showed up as a deficit of the National Bank of Yugoslavia, that is, as a public debt (see Bole and Gaspari 1989). Ultimately, the household sector financed the subsidies through the inflation tax.

2.3 Redistribution by regions[21]

The less-developed regions (LDRs) of Yugoslavia, Bosnia and Herzegovina, Macedonia, Montenegro, and Kosovo, were the main beneficiaries of redistribution. The main source of redistribution was subsidized credits, as shown by large net money gains of LDRs manufacturers (see table 2, column 1). Aided by transfers from the Fund for Development of Less-Developed Regions, LDRs were also able to levy much lighter taxes and quasitaxes on their enterprises than the more-developed regions (MDRs). Looking at the overall redistribution, net subsidies for LDR manufacturing amounted to 57 percent of LDR's income from manufacturing; and net subsidies for Montenegro's and Kosovo's manufacturing considerably exceeded the two regions's income from manufacturing. The enterprises of only one region, Slovenia, were net tax-payers.

Table 2: REDISTRIBUTION BY REPUBLIC AND AUTONOMOUS PROVINCE[a]/ (as a %)

	Formal taxes	Formal subsidies	Quasi-taxes	Quasi-subsidies	Losses on money	Gains on money	Net subsidies[b]
Yugoslavia	14	1	25	13	88	132	18
Less-developed regions	9	1	19	12	105	177	57
Bosnia	9	1	21	11	118	178	43
Montenegro	8	1	18	15	104	236	123
Macedonia	11	0	17	13	86	135	35
Kosovo	8	0	15	15	68	220	145
More-developed regions	16	1	27	13	83	117	5
Croatia	15	1	32	10	86	136	13
Slovenia	17	0	23	24	77	83	-11
Serbia [c]/	16	1	25	9	84	125	10

a/ Income-weighted mean of firms' rates (the firms' redistributive flows as a percentage of the firms' income).
b/ Defined as the difference between the sum of subsidy rates and the sum of tax rates.
c/ A defect in the data base made it impossible to distinguish Vojvodina from Serbia proper. The two are listed as "Serbia" here.

21/ We refer to Yugoslavia's republics and autonomous provinces as regions.

The heavy subsidy of LDRs suggests a Gerschenkronian interpretation, the government-mediated transfer of capital to fight backwardness (Gerschenkron 1962). The less-developed regions appear to be using fiscal policy and bank credits to promote and direct industrial development.

Even though the data allow us to determine only the recipients, not the donors of net subsidies, the data suggest that transfers from richer to poorer regions well exceeded the ones mandated by law of 1.5 to 2 percent of GDP for the more developed regions. The most important source of subsidies was net money gains and such gains were financed by taxing the population at large. Even if one assumes that taxes were spread evenly across republics, thus ignoring direct transfers from more-developed to less-developed regions, the more-developed regions turn out to be net taxpayers, at 13 percent, and the less-developed regions net beneficiaries, at 40 percent, substantially above the rate that would be generated through mandated transfers.[22]

More-developed regions have always looked upon development transfers as a burden, so it is surprising that actual redistribution exceeds what is mandated. There are two reasons this is so. First, such subsidies are the outcome of the federation yielding to the LDRs' pressures to make up for both enterprise losses and local government deficits. Second, Yugoslavia's development plan for LDRs has historically favored capital-intensive industries. That plan was backed with concessionary credits and direct investments by firms from MDRs.[23]

2.4   Redistribution by industries

Net subsidies also differ widely across industries (table 3). In the food sector, in heavy manufacturing, and particularly in the energy sector, subsidies exceeded taxes; only light manufacturing was a net taxpayer.[24] Such a pattern of subsidization reflects a conscious price policy: prices of energy and food were kept low to stimulate consumption, energy producers were

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22/   That rate would be about 5 to 6 percent. The GMP of less-developed regions was about one-third of that of the more-developed regions in 1986.

23/   To offset the policy of cheap credits, LDRs' prices might have been depressed, as often argued in the Yugoslav political arena but no convincing evidence has been advanced on either side.

24/   We define the sectors as follows: energy includes industries 101 to 105 (electric power to oil processing in table 3); food industries 130, 131 and 132 (food processing, drink, and meat); heavy industry sectors 106 to 119 (from iron ore refining to chemical processing); and light industry from 120 to 139 (from stone and gravel to other), excluding food sectors 130 to 132.

compensated through direct contributions by enterprises; and the emphasis on heavy manufacturing can be traced back to Lenin.

3. DETERMINANTS OF REDISTRIBUTION

What are the driving forces behind such variable taxation and subsidization across enterprises? The most significant factor is the quest for job and wage security.[25] As we shall show, (1) redistribution levels out differences in income per worker among enterprises, and (2) net subsidies per worker are negatively related to income per worker and positively to capital per worker. Additional factors of redistribution particularly helped firms in less-developed regions.

3.1 The link between the pre- and post-redistribution income per worker

A useful tool for exploring the redistribution of income among enterprises is a cross-tabulation matrix that links the ranking of enterprises according to their pre-redistribution income per worker to the ranking of enterprises according to their post-redistribution per worker (table 4). If subsidies were uniform and thus neutral, the cross-tabulation matrix would be the unit matrix.

Redistribution in Yugoslav manufacturing is profoundly non-neutral, in 37.8 percent of enterprises, the original income category changes after redistribution is accounted for, with the overall effect of leveling out differences in income per worker among enterprises. After redistribution, there are no enterprises with negative income per worker, as opposed to 12.5 percent of the enterprises before redistribution. Moreover, more than half the enterprises that originally showed negative income per worker jump even into the medium- or high-income category after redistribution. Similarly, fewer than half of the enterprises with high income per worker remain in the same category after redistribution. Only in low- and medium-income categories do the majority of enterprises remain in their respective categories.[26]

Another way to see the effects of redistribution is to plot actual post-redistribution and recalculated pre-redistribution income per worker (figure 1). For easier comparison, we added a lump-sum subsidy to the recalculated income to make the mean of recalculated income per worker coincide with the

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25/ In a public-choice analysis of the redistribution in reforming socialist economies; viewing redistribution as a confrontation between distributive coalitions, Vodopivec (1991) reached the same conclusion.

26/ These findings echo Schaffer (1990a). The reason for the main difference all Polish high-income enterprises remain in that category after redistribution, and only 42.5 percent do so in our case is that Schaffer does not include taxes.

mean of actual income per worker. Like the cross-tabulation table, Figure 1 shows that redistribution compresses differences in enterprises' income per worker.[27] The actual distribution is much narrower than the one recalculated, and has a much higher peak. The standard deviation of the actual distribution is only 30 percent of the standard deviation of the recalculated distribution (see Annex Figure 1).

3.2   Econometric analysis

To hypothesize about the determinants of redistribution, one must look at the institutions in place in Yugoslavia in 1986, above all, at the control mechanism for personal earnings. The firm's socially warranted personal earnings fund was determined by comparing the firm's actual income with the prescribed norm for income as determined, above all, through industry-specific norms for average wages.[28] If actual income exceeded the norm, the firm was allowed to pay above-average wages, but a fraction of the excess income was taxed. If actual income fell short of the norm, the firm had to pay below average wages, but, compared with firms with income above the norm, its wage bill could exhaust a larger share of the firm's income. That is, the firm effectively received a subsidy amounting to a fraction of the shortfall in income. A firm's net subsidy function can be specified as follows:

$$S = a(Y^n - Y) \tag{1}$$

where S is the firm's net subsidies, overall taxes minus overall subsidies), Y^n is its norm for income, Y is its income, and $\underline{a}$ is a fraction of income to be taxed (subsidized). Furthermore, as the control mechanism stipulates, $Y^n = Nw^n$, N is number of workers in the firm, and w^n is a norm for average wages, so (1) can be transformed to an empirically estimable form:

$$S/N = c - a(Y/N) \tag{2}$$

where $c = aw^n$.

27/   Redistribution shows similar effects in terms of original and post-redistribution profitability in Hungary (Kornai and Matits 1987).

28/   See, for example, *Official Gazette of the Socialist Republic of Slovenia*, No. 20, 1987. Norms for average wages were assessed by a special body representing the republic's government and other political and economic agents, the Committee of Participants of the Social Compact on Income Distribution.

A caveat is in order on the theoretically admissible range for the parameter a fraction of the income taxed or subsidized. Were the actual income Y free of any components of redistribution, such a range would evidently be an open interval (0,1). The data for Y, however, are already contaminated by some redistribution, notably, money gains on credits for fixed assets, so the range for a extends beyond 1.[29]

We also hypothesize that net subsidies depend on capital intensity. In the 1980s, there was little self-financing of Yugoslav firms; rather, firms usually financed a substantial part of their investment with outside credits (Gaspari 1991). Under the circumstances, more capital-intensive firms were more likely to receive net subsidies through both bank credits and the pooling of resources with other firms.

Finally, to allow for possible regional differences, we also included in the regression regional dummies. The region omitted was Slovenia, the region with the smallest net subsidy (see table 2), so the sign on regional dummies is expected to be positive.

The results of regressing net subsidy per worker on firm's income per worker, capital intensity, and a regional dummy confirm our hypotheses about the forces of redistribution (table 5; see Appendix 2 for the definition of variables).[30] Except in four cases the coefficients of income per worker are all significant and the implied taxation rates, the negative values of the coefficients of income, are in the theoretically permissible range. Somewhat weaker is the evidence on the effects of capital intensity; still, the predicted positive value of that parameter was obtained in 22 out of 27 industries, 10 of which were statistically significant at 5 percent. Finally, the predominantly positive regional dummies, most of them for less-developed

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29/ If a_1 and a_2 are the parameters obtained from (2) under the assumption that Y is income before and after redistribution, respectively, then $a_2 = a_1/(1-a_1)$.

30/ Twenty seven industries at the 5-digit level with at least 85 organizations were selected total of 4323 units, 50 percent of the larger sample studied above.

regions, show that forces unaccounted for by the above two variables favored less-developed regions. These were probably political forces, aiming both at financing enterprises' losses and government spending and at promoting the development of less-developed regions (Annex Table 3).

4. CONCLUDING REMARKS

Redistribution of income in Yugoslavia was pervasive and massive, with gross subsidies in manufacturing of 50 percent, and net subsidies of 15.6 percent of GDP. Channels of redistribution differed significantly from those in other Eastern European countries, but we found a similar driving force behind redistribution: the pursuit of job and wage security. Determinants of redistribution included a firm's capital intensity and the promotion of less-developed regions.

This analysis for Yugoslavia suggests an important lesson for the process of transition in Eastern European economies. As the economy decentralizes, with decisionmaking shifting to local governments and enterprises, powerful coalitions emerge that represent special interests, and many new channels of redistribution may open. Where multiparty democracy is still developing and property rights are ill-designed, decentralization may thus increase, not decrease redistribution a possibility called the decentralization trap (Klaus 1990).

Policy advisors for economies in transition often grossly overestimate a government's ability to exert monetary and fiscal discipline. Of course, introducing modern taxation, of value added and personal earnings, for example, better tax collection through an internal revenue service, and the overhaul of the banking sector would help achieve such discipline, but the disentangling the Gordian knot of government, banks, and firms remains a problem during the transition, a problem that will disappear only with deep structural economic changes including clarification of property rights and the development of a democratic political system.

Based on the findings of the paper, we must also seriously question the appropriateness of many analyses of, and conclusions drawn from, the Yugoslav experiment. Most studies of the Yugoslav economy take for granted that "[w]orkers have nontradable claims on the year-by-year residual cash flows contingent on employment" (Jensen and Meckling 1979, p. 482, and other the studies in the Illyrian vein, for example). Evidence that income is massively redistributed among firms casts doubts on the validity of such an assumption and thus on results of the studies based on it (for example, Hinds 1991).

APPENDIX 1: HOW REDISTRIBUTIVE FLOWS ARE CALCULATED

Formal taxes

Formal taxes are calculated as the sum of the following items from the income statement:
- Obligations to BOALs providing services in education, science and culture, health, social security, other social services determined by law, pension and disability insurance.
- Obligations for housing solidarity.
- Obligations for employment and social security of workers.
- Republican income tax.
- Expenses for maintaining and improving the environment.
- Memberships.
- Expenses for national defense and social self-protection.
- Contributions for Economic Chambers and other professional organizations.
- Other obligations from income.
- Part of the income for other specific purposes.
- Monopoly part of income transferred to other enterprises.
- Part of the net operating income used to cover the losses of other BOALs.
- Part of net operating income for other purposes.
- Part of net operating income for other funds.

Formal subsidies

Formal subsidies are calculated as the sum of the following items (all memorandum items on the income statement, except "coverage of the loss from previous years," which is taken from the "special accounting data set"):
- Coverage of losses from the fund for joint reserves of sister BOALs.
- Coverage of losses from common risk-bearing within a WOAL.
- Coverage of losses from other sources of a nonreimbursable nature.
- Coverage of losses from resource pooling.
- Coverage of losses from previous years (received in the current year) by nonreimbursable resources, and debt write-offs incurred to cover losses from previous years.

Quasitaxes

A quasitax base is calculated as the sum of the following items from the asset side of the balance sheet:
Claims within a WOAL
- Coverage of the losses of other BOALs.
- Rehabilitation credits.
- Short-term and long-term resource pooling.

Short-term lending
- Purchase of securities.
- Resource pooling with other firms.
- Resource pooling in the internal bank.

Long-term lending
- Pooling with other firms.
- Pooling in the SMCIs of material production.
- Resource pooling in the internal bank.
- Resource pooling in banks.
- Resource pooling with firms from the less-developed regions.
- Resource pooling with other social agents.
- Pooling in the development fund of the sociopolitical community.
- Long-term rehabilitation credits.
- Lending to the Federal Fund for Acceleration of the Development of Less Developed Regions.
- Lending according to the regulations of sociopolitical communities.
- Purchase of securities and other long-term lending.

Financial investment in reserve and solidarity funds
- Claims for resources pooled in the fund for joint reserves of the WOAL.
- Claims for resources pooled in the fund for joint reserves of
  Sociopolitical Communities.
- Claims for rehabilitation credits from the reserve fund.
- Purchase of securities and other lending from the reserve fund.
- Claims for pooling of resources from the solidarity fund.

Quasisubsidies
     A quasisubsidy base is calculated as the sum of the following
liabilities:
- Liabilities for the part of the business fund to cover losses.
- Liabilities from long-term pooling (with other BOALs, in the SMCIs of
material production, with banks, other social agents, farmers, and private
persons).

Short-term liabilities
- For long-term rehabilitation credits.
- For short-term rehabilitation credits.
- For underpaid income taxes.
- For underpaid contributions based on income.
- For other underpaid obligations based on income.
- For taxes on personal incomes.
- For contributions based on personal income.
- For resources lent to cover losses during the year within a WOAL.
- For rehabilitation credits within a WOAL.

Liabilities from the reserve fund
- To other firms.
- Other liabilities.

Liabilities from the solidarity fund and the fund for other purposes
- Liabilities for the resources of the solidarity funds lent by other firms.
- Other liabilities from the solidarity fund.
- Liabilities for the resources for other purposes lent by other firms.
- Other liabilities for the resources for other purposes.

Losses on money
     The sum of the following assets is the base used to calculate losses on
money:
- Money assets.
- Securities (checks, promissory notes, bonds, other).
- Claims on the basis of business relations.
- Claims on the basis of income.
- Claims within a WOAL.
- Paid obligations from income.
- (Short-term and long-term) lending.
- Money assets held for investment purposes.
- Claims for advances of investments.
- Reserve fund assets.
- Assets of the solidarity fund and assets for other purposes.

Collective consumption assets
- Money assets.
- Financial assets pooled in the SMCIs for housing.
- Pooled resources for housing within a WOAL.
- Other lending from resources earmarked for housing.
- Claims from resources earmarked for housing.

Assets earmarked for other needs of collective consumption
- Money assets.
- Pooled resources for other needs within a WOAL.
- Pooled resources for other needs.
- Other lending from resources earmarked for other needs.
- Money assets held on giro account.
- Claims from resources earmarked for other needs.

The reduction of losses on money mentioned in the text (returns on the above financial investments) is calculated as the sum of interest revenues, revenues from participating in joint bank income, and revenues from participating in the joint income of other enterprises, minus expenses for covering the loss of other enterprises as stipulated in the agreement on resource pooling.

Gains on money
The sum of the following liabilities is used as the base for calculating gains on money:
- Long-term credits.
- Short-term credits.
- Liabilities for short-term pooled resources.
- Liabilities from business relations, except liabilities to workers.
- Liabilities on income, except for distributed net income for personal incomes.
- Liabilities for taxes and contributions.
- Liabilities within a WOAL.
- Liabilities for pooled solidarity resources.
- Liabilities for other solidarity resources.
- Liabilities for pooled resources for housing.
- Liabilities for loans earmarked for housing.
- Other liabilities for resources earmarked for housing.
- Liabilities for pooled resources for other needs of collective consumption.
- Liabilities from loans for resources for other needs of collective consumption.
- Other liabilities for resources earmarked for other needs of collective consumption.
- Other sources of resources earmarked for other needs of collective consumption.

The reduction of gains on money (interest payments on the above financial investments) is calculated as the sum of interest payments for credits for working capital, interest payments for credits for fixed assets, payments of dividends to other enterprises, and payments of dividends to foreign persons.

APPENDIX 2: DESCRIPTION OF DATA AND VARIABLES

Empirical analysis is based on income statements and balance sheets of all (8,689) Yugoslav manufacturing enterprises, obtained from the Public Accounting Office of Yugoslavia. The units included in the empirical analysis are both Basic Organizations of Associated Labor (BOALs) and so-called Uniform Working Organizations (enterprises that do not consist of BOALs).

The variables used in econometric analysis are defined as follows:

NET SUBSIDIES   –   the difference between overall subsidies and overall taxes (see Appendix 1);

INCOME   –   net value-added (revenues minus material costs, with depreciation included in material costs);

CAPITAL   –   present value of fixed assets;

WORKER   –   yearly average of the end-of-the-month number of workers.

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Annex Table 1: Net Subsidies by Industry

Industry	No. of Units	Income-Weighted Average Net subsidy Rate (as a percentage)
Energy	640	104
Electricity	465	155
Coal mining	139	17
Coal processing	10	-37
Oil production	2	-172
Oil refining	24	310
Heavy Manufacture	3617	12
Iron ore mining	14	102
Iron and steel	156	56
Nonferrous ore mining	66	93
Nonferrous metal production	43	134
Nonferrous metal processing	47	-7
Nonmetallic minerals production	85	-10
Nonmetallic minerals processing	165	0
Metalworking	1003	0
Machine-building	497	-6
Transport equipment	282	18
Shipbuilding	105	42
Electrical machines and equipment	515	-12
Production of chemicals	205	37
Processing of chemicals	434	-25
Light Manufacture	3411	-7
Stone and gravel	130	0
Building materials	340	22
Sawmills	287	-7
Furniture	583	17
Paper	166	15
Yarn and fabrics	296	-11
Textile products	706	-16
Fur and leather	68	-07
Leather footwear and goods	228	-24
Rubber	88	-33
Tobacco	94	17
Printing	307	-27
Recycling	60	-37
Other	58	-1
Food Sector	1021	29
Food products	778	29
Beverages	188	20
Animal feeds	55	77

Annex Table 2: The Cross Tabulation Matrix

Income	Income Per Worker After Subsidies				
per worker before subsidies	Negative Income	Low Income (0-660)	Medium Income (660-2260)	High Income (2260-)	Row total
Negative Income	0 0.0%	376 39.1%	471 49.0%	114 11.8%	961 12.5%
Low Income (0-568)	0 0.0%	597 50.2%	581 48.8%	11 0.9%	1189 13.7%
Medium Income (568-1901)	0 0.0%	340 8.0%	3800 89.0%	46 1.1%	4186 48.3%
High Income (1901-)	0 0.0%	2 15.0%	1339 71.0%	995 13.0%	2336 100.0%

Annex Table 3: ESTIMATES OF THE INTERFIRM TRANSFER FUNCTION[a]

Industry	COMMON INTERCEPT[b]	INCOME/ WORKER	CAPITAL/ WORKER	REGIONAL INTERCEPTS[c]	R^2
Electric power distribution	532.63 (1.20)	-.76** (-6.35)	.03 (.20)	K 1595.15+ (1.67)	.18
Drawn and rolled steel	-2265.73** (-2.73)	.28 (.95)	.47* (2.53)	K 1247.56+ (1.84) MA -14.78* (2.24) MO 1825.88** (3.93) BO 196.71** (2.77) SR 3260.68** (4.10)	.23
Cast metal products	256.65 (.95)	-.49** (-4.57)	.41** (15.49)	K 1679.98* (2.06) MO 3509.08** (4.80) BO 860.24* (2.41) SR 686.69+ (1.79)	.68
Tools	41.53 (.18)	-.37** (-4.77)	.09 (.38)	K 3212.50** (2.86) MA 930.00* (2.08)	.18
Metal construc-tion elements	274.43+ (1.84)	-.27** (-4.26)	.19 (1.04)	MA 730.82* (2.44)	.12
Metal furniture and appliances	732.59** (3.53)	-.49** (-9.09)	-.38 (-.88)	MO 3529.34** (3.44)	.44
Specialized industrial machines	1311.11** (6.92)	-.73** (-12.00)	-.16 (-.49)	CR 913.24* (-2.08) SR 949.15+ (-1.88)	.46
Vehicle parts	2352.54** (7.18)	-1.65** (-21.81)	.64** (3.69)		.85

Electric machines	-369.86 (-1.46)	-.09 (-.84)	.47 (1.54)	K 728.05* (2.08) MO 1738.10* (2.41) MA 294.94+ (1.83) BO 279.13* (2.56) SR 176.99* (2.28)	.09
Chemical production	750.88 (.50)	-.44* (2.12)	.62** (4.79)		.22
Processing of plastic	-413.11* (-1.99)	-.26** (-4.01)	.80** (4.14)	K 1872.94** (5.23) MA 1032.41** (4.01) MO 1077.03** (2.67) BO 375.28* (2.49) SR 319.65** (3.14) CR 138.70** (2.68)	.37
Disinfectants, explosives and other chemicals	647.74 (1.45)	-.51** (-7.37)	-.17 (-.54)		.50
Stones	261.50 (.54)	-.39** (-3.56)	.36 (1.47)		.09
Production of bricks	379.25* (2.55)	-.59** (-5.23)	.59** (3.41)		.26
Manufacture of building materials	263.55 (.91)	-.39* (-2.11)	.89+ (1.97)	K 1390.01** (2.84)	.16
Sawmilling	424.28+ (1.82)	-.85** (-8.33)	.34+ (1.93)	MO 955.38* (2.07) CR 803.43* (2.25)	.38
Furniture	281.94** (2.63)	-.37** (-6.48)	-.02 (-.13)	BO 622.50** (2.99) CR 551.28** (2.61)	.18

Production of construction elements	301.46 (.65)	-.33 (-1.03)	-.33 (-.57)	MA 2604.77** (3.83)	.10
Manufacture of cotton fabrics	500.86+ (1.92)	-.69** (-5.69)	.06 (.38)		.37
Knitwear	-7.24 (-.04)	-.52** (-4.60)	.21 (1.17)	SR 324.56** (2.81) CR 347.09** (3.20) BO 451.40** (3.71)	.42
Garment	381.90** (4.74)	-.57** (-11.51)	.44** (4.60)	MO 784.60** (2.93) CR 253.12* (-2.27)	.46
Footwear	160.00+ (1.73)	-.49** (-8.46)	.42** (2.93)	K 569.26* (2.16) MO 575.78* (2.40) MA 362.40+ (1.88) CR 268.44+ (1.68)	.43
Wheat Flour	1412.52** (2.85)	-.21 (-.94)	.67* (2.36)	CR 543.74* (-2.19) MA 288.27* (-2.37) SR 666.61+ (-1.80)	.03
Bread and baked goods	531.83** (2.81)	-.59** (-6.30)	.32** (3.63)	K 1142.70* (2.44)	.41
Vegetable and fruit processing	638.12 (1.18)	-.55* (-2.58)	.72 (1.48)	MA 2269.07* (2.34) BO 2086.07** (2.66)	.19
Slaughtering	1598.02** (4.24)	-1.15** (-6.37)	.66 (1.46)	CR 918.32+ (-1.91)	.30
Printing	359.96** (3.43)	-.65* (-14.39)	.27+ (1.91)	MO 741.06* (2.04) BO 572.46* (2.00)	.49

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[a] Numbers in parentheses are t-statistics. + denotes significant at 10%;
* significant at 5%, and ** significant at 1%.
[b] Common intercept is Slovenia plus any regions not listed under
regional intercepts.
[c] For the regional intercepts, BO=Bosnia-Hercegovina, CR=Croatia,
K=Kosovo, MA=Macedonia, MO=Montenegro, SR=Serbia proper plus Vojvodina.
The t-statistics in this column apply to the intercept dummy rather than
the regional intercept per se. Hence, a negative sign on the t-statistic
means that the regional intercept is smaller than the common intercept
(but still possibly positive).

Figure 1: Actual and Recalculated Income per Head
for Yugoslavia, 1986
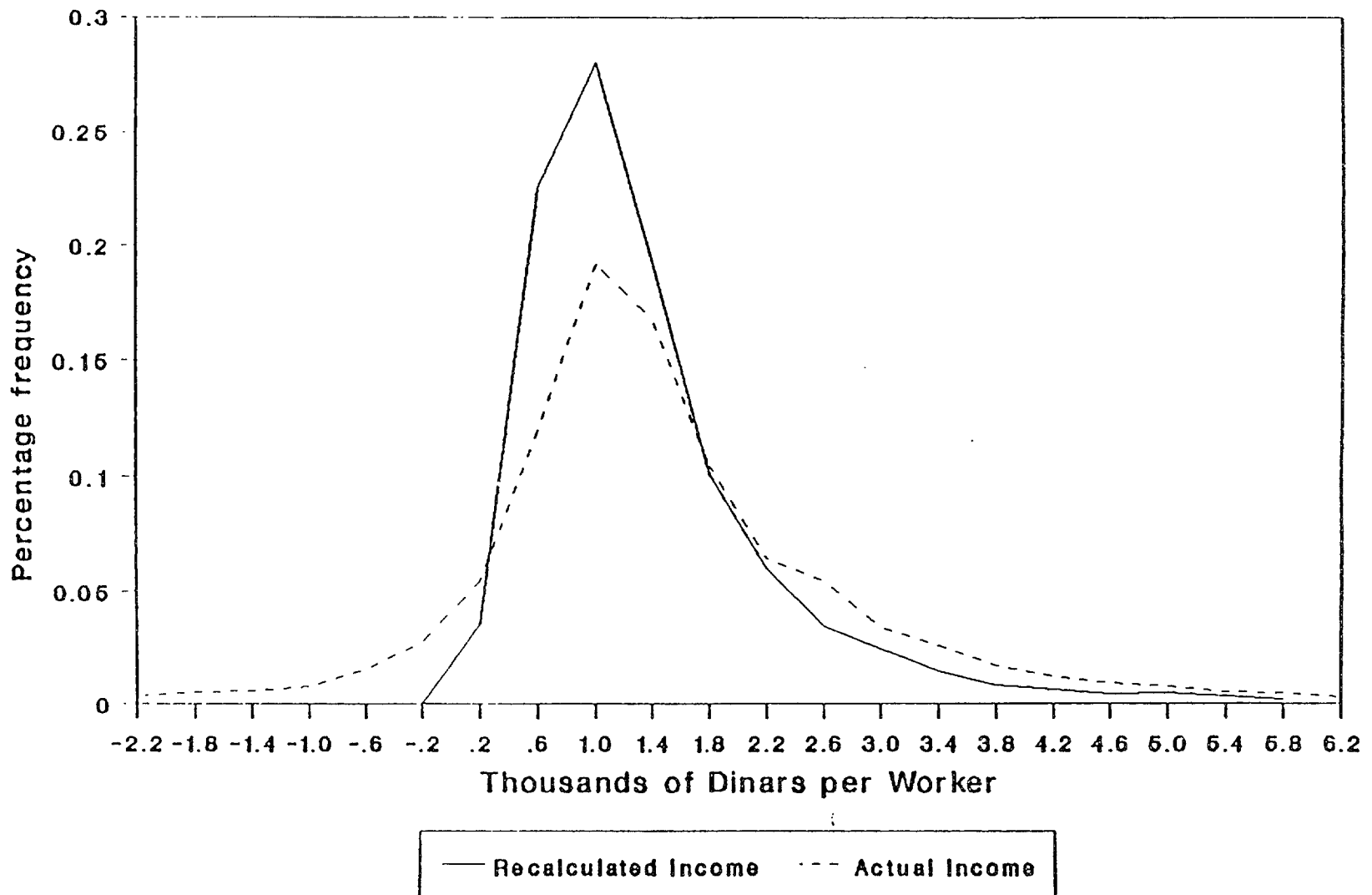
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