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POLICY RESEARCH WORKING PAPER

Services as a Major Source of Growth in Russia and Other Former Soviet States

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Russia and the other former Soviet states have little experience with private services and a historically negative view of their role in the economy. A good argument can be made for the international community's strong involvement in services.



Summary findings

Private services could contribute greatly to economic growth in Russia and the other former Soviet states. Easterly, de Melo, and Ofer use econometric analysis to identify the gap between expected and actual levels of service activities in these countries and simulate the effect on GDP and employment of closing the gap. The gap is particularly wide for business and consumer services. Transport and publicly provided services are comparable to, or higher than, those in other countries.

Traditionally, the Marxist doctrine of socialist economies has labeled services "nonproductive." And there is continuing evidence that national policies in these countries favor producers of goods over producers of services. In Russia, for example, there was until recently a 25 percent ceiling on trade margins for some products, and the enterprise profits tax is higher for producers of services than for producers of goods. Also, coefficients for real estate lease payments are sometimes higher for service firms.

It will be important for Russia and the other former Soviet states to identify a policy agenda to facilitate the rapid expansion of services. The policy agenda should

entail legal, economic, and institutional changes to eliminate the current bias against services, so that service firms can operate on a level playing field. It should also include proactive programs to stimulate a rapid increase in the level of service activity.

Appropriate measures may include:

- Changes in the tax law, the regulatory framework, and other economic incentives.
- Government programs to accelerate private sector development and the privatization of government distribution and service activities.
- Training for enterprise employees to facilitate their transfer from production to service activities.
- Action to support the orderly development of input and output markets.
- Creation of a modern banking system that will use appropriate criteria to provide credit to service enterprises.
- Consideration of service activities as priorities for international technical assistance and direct foreign investment.

This paper — a product of the Transition Economies Division, Policy Research Department — is part of a larger effort in the department to address issues of economic reform and growth in the former socialist countries. The study was funded by the Bank's Research Support Budget under research project "Business and Consumer Services in the Former Soviet Union" (RPO 677-43). Copies of this paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Chris Rollison, room N11-029, extension 84768 (64 pages). April 1994.

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SERVICES AS A MAJOR SOURCE OF GROWTH IN RUSSIA AND OTHER FORMER SOVIET STATES

by

William Easterly, Martha de Melo and Gur Ofer

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SERVICES AS A MAJOR SOURCE OF GROWTH IN RUSSIA AND OTHER FORMER SOVIET STATES

by

William Easterly, Martha de Melo and Gur Ofer¹**A. Introduction****Purpose and Organization of this Paper**

Services are playing an increasingly strong role in developed market economies, reaching two-thirds of GNP in some countries. In Russia and other former Soviet states, which are currently undergoing a painful transition from central planning to a market economy, services have historically played a smaller role. In this paper, we look beyond the transition period, which has so far been characterized by financial instability and a general contraction in output and employment, to a period of positive growth and structural change. We argue that services, and in particular business and consumer services, will be a major source of growth in the coming years because: (i) the large gap between the current level of service activity in socialist countries and the expected level, based on international experience, implies growth of the service sector itself; and (ii) positive effects on the economy at large arising from increases in the quantity, quality, and diversity of services are likely to generate productivity increases in the goods producing sector. If this view is correct, it has

¹ William Easterly and Martha de Melo are in the Policy Research Department of the World Bank; Gur Ofer is at the Hebrew University in Israel. The findings, interpretations, and conclusions in this paper are the authors' own. They should not be attributed to the World Bank, its Board of Directors, its management, or any of its member countries. We thank Olga Sandler for her valuable research assistance.

important implications for the policy agenda of Russia and other former Soviet states.

The evidence for these two arguments is summarized below in the remaining two parts of the introduction. Section B below explains the source and organization of the international and Soviet data used in the cross-country analysis of the role of services. Section C then reports on the statistical analysis of the role of services and provides estimates of the gap in the actual and expected levels of service activity in Russia and other former Soviet states. Section D discusses the possible contribution of services to growth in Russia and other former Soviet states based on simulations of expected levels of service activity. Implications are then drawn for the governments' policy agenda.

The Gap in Service Levels

It is well known among Soviet specialists that the structure of the USSR economy, and to a lesser extent other socialist countries, was distorted compared to other countries--with a large industrial base and a small service sector. This unique economic structure developed for several reasons. First, central planning replaced the decentralized trading function with a centrally directed distribution system. Second, private production -- which might have otherwise fostered local, decentralized service providers -- was banned. And third, a Marxian doctrinal bias against both "non-productive" services and consumption led to a double bias against household consumption of services. The service deficit economy has been identified and discussed in such studies as Ofer 1973 and 1987 and others.

In 1985, only 40 percent of the GDP at factor cost of the USSR was produced by service industries -- including both publicly and privately provided services -- and only 39 percent of the USSR labor force was employed by the service

sector. Anyone interested in making a crude international comparison will find that these levels are significantly lower than the corresponding ones for "middle upper-income countries" as defined by the World Bank, where service shares were 50 and 53 percent respectively; for five of the lower income countries in the Organization for Economic Development and Cooperation (OECD), where service shares were 55 and 43 percent respectively; for OECD as a whole, where both service shares were 61 percent; and for the United States, where service shares were 67 and 69 percent respectively.²

As will be shown below, levels of publicly provided services are comparable to, or higher than, those in other countries; so the gap in private services is even larger than these aggregate figures suggest. A major objective of this study is to provide current estimates of the gap between the actual and the expected levels of service activity in Russia and other former Soviet states, where adjustments are made to Soviet and international data on services to achieve comparability and where data is disaggregated to arrive at comparisons for service sub-sectors and for individual Soviet republics.³

Externalities from the Expansion of Services

A fairly extensive literature has developed over the last 25 years on the growth potential of the service sector. A seminal article by Baumol 1967, followed up by Baumol et al. 1985, argues that the inherent technological structure of many services inhibits productivity growth and results in increasing real costs and increasing difficulties of government to finance expected

² All data for comparator countries are for a year during the late 1980s.

³ Previous estimates of the sub-sectoral gaps in USSR services are provided by Ofer 1973, and more recent estimates of service shares for Eastern Europe and the USSR are provided in OECD 1991. See also Schroeder 1987.

services. This thesis has remained controversial, with Baumol maintaining that this phenomenon is explained by the intrinsically labor-intensive nature of these activities in the face of a high income elasticity of demand and others (see for example Fuchs 1969) maintaining that difficulties in measuring output and prices of services may result in an underestimate of productivity growth in services.⁴ Griliches 1992 addresses this controversy head on by exploring in detail how services output and prices are measured by official data collection units in developed countries. He concludes that for many sectors -- such as health care, financial services, and retail trade -- productivity measures require additional relevant data on the uses of consumer time and on household and firm activity not captured by market-based statistics. For other sectors -- such as transport, communications, education, and other public services -- progress has been made in defining new approaches to productivity measurement. But no resolution of the original controversy is achieved. For example, although the Summers and Heston chapter in this book (used below for international comparisons of services in final use) tends to support the Baumol hypothesis, Griliches sums up his introduction with a more positive view of productivity growth in the service sector.⁵

While efforts to measure productivity growth within services continue, important conceptual arguments have been developed to support the existence of positive externalities from the service sector. Such arguments are found in Wallis and North 1986, Romer 1987 and 1991, and Giarini 1987 and 1989. Wallis

⁴ An example is the failure of national accounts to capture increases in productivity due to wide-scale introduction of computers.

⁵ In their chapter, Summers and Heston base their analysis on final services; however, most of the growth of service activities in recent decades has been concentrated in intermediate services.

and North 1986 make the general point that services enhance productivity in the goods producing sectors--whether they are provided inside or outside the firm.⁶ Romer refines this argument by pointing out that the development of services facilitates specialization and hence productivity growth in firms producing goods.⁷ Giarini, among others, argues that financial and informational services reduce risk and uncertainty, hence reducing overall costs. Although plausible, such ideas are not yet backed up with empirical work.

A further point in considering services as a source of growth is that slow downs in productivity growth in services experienced by the developed countries will not necessarily apply to the developing countries, which can benefit from technological advances achieved elsewhere. Thus, there is strong reason to believe that former socialist countries, where services were repressed, will benefit from a wide range of service-related productivity enhancements.

B. International and Soviet Data on Services

The service sector is defined here to cover all economic activities other than agriculture, mining, manufacturing, construction, and utilities.⁸ The many remaining activities included in the service sector differ according to function, factor intensity, technological sophistication, and size. It is therefore important to sub-divide services into various sub-sectors, to arrive at more homogeneous activity groups. There is little standardization of sub-sector groupings (not only between socialist and non-socialist countries, but also among

⁶ See also Gershuny 1987 and Ott 1987.

⁷ See also Grossman 1989 and Grossman and Helpman 1989.

⁸ There are diverse views about the definition and measurement of services. Some definitions, for example, also include construction and utilities.

non-socialist countries); but we believe there is a logical classification into three distinct sub-sectors: infrastructure services (transportation and communication), public services (education, health, and public administration), and business and consumer services (all other services, including housing).⁹

The international data used in the regression analysis reported in Section C consist of two data sets: 25 developed countries covered by the Organization for Economic Development and Cooperation (OECD) national accounts data, and 160 countries covered by data compiled for the World Bank's World Tables. The latter data set is referred to as "world economies"; it includes aggregated OECD national accounts data, national accounts data for developing countries taken from country-specific sources, and data on employment from the International Labor Office (ILO). The advantages of the "world economies" data set are that it is a larger sample and provides more natural comparators to some of the poorer Soviet republics; its limitation is that there is little disaggregation by sub-sector. The more detailed OECD national accounts data are used independently of the "world economies" data set because they permit a separation between public services, such as health and education, and private business and consumer services. The limitations of the OECD data are that they represent fewer countries and these countries have higher per capita incomes than the former Soviet states.¹⁰

⁹ In principle, housing might best be classified with infrastructure services, but OECD data classify it with financial services and Soviet data classify it with community services--hence the classification here with business and consumer services.

¹⁰ In addition to these two data sets, the discussion on End Use in Section C draws on estimates of real services for 60 countries by Heston and Summers in Griliches 1992.

The data used for the USSR are shown in the four tables of Appendix A. Appendix Table A1 shows GNP of the USSR by sector of origin, based on the U.S. Congress JEC (or CIA) 1970-based constant price data for the 1960s and 1970s and their 1982-based constant prices for the 1980s. A distinction is made between market prices, also known as "established" prices, and true factor costs, where the latter are arrived at by subtracting taxes, adding back subsidies, charging correct rates for depreciation and return on capital, and adding second economy provision of services. The analysis of service shares in total value added is based on these factor costs, which provide significantly higher service share estimates. Specifically, in the most recent JEC calculation of GNP at factor costs in 1982 prices, the share of consumer services is nearly double that at market prices -- more than half the difference being concentrated in housing services where subsidization is very high.

Appendix Table A2 shows USSR employment by sector, both including and excluding private agriculture. The data are taken primarily from the U. S. Bureau of Census; and the estimates including agriculture are used in the comparison of the USSR and OECD countries. Appendix Table A3 shows employment by sector for each of the republics as well as for the USSR as a whole. These data were obtained from Goskomstat and the Center for Economic Forecasting of the Ministry of Economics for Easterly and Fischer 1992. They are the only employment data available for the republics and appear to exclude private agriculture, which would bias the Soviet data against the hypothesis of smaller service sectors. They are used in the comparison with the "world economies".¹¹

¹¹ These and accompanying data, including net material product in comparable prices, labor force, and capital stocks in comparable prices, by sector and by republic, 1970-90, are available from W. Easterly, World Bank, 1818 H St. NW, Washington DC 20433.

Appendix Table A4 shows household consumption and the share of goods and various services consumed by households as a percent of GNP; data sources are similar to those for Table A1.

C. International Comparisons of Service Activity

How low were services in the Soviet Union? In this section, we present some estimates of how far Russia and other former Soviet states are below international activity norms for different services. Activity levels are measured by shares in value added, employment, and end use.

For value added and employment, the approach is to use regression analysis to compare the sectoral structure of Russia and other former Soviet states with countries at similar levels of PPP-based per capita income. For countries other than the USSR, PPP-based per capita incomes are taken from the Summers and Heston data set (see Summers and Heston 1988). For Russia and the other Soviet republics, we use World Bank estimates of PPC-based per capita GDP for 1987.¹² Yearly estimates are extrapolated on the basis of real growth rates for the USSR and periodic information on ratios of per capita income in each of the republics as compared to the Union.¹³

Regression analysis is undertaken for total services and for service sub-sectors coinciding or falling within the conceptual categories distinguished above -- namely, infrastructure, business and consumer services, and public services. Emphasis is given to the business and consumer services category, by investigating its major components -- trade, financial services, and consumer services. Services in this category are normally provided by the private sector

¹² See the World Bank's World Development Report 1993, Table 30.

¹³ USSR real GDP growth rates are taken from Easterly and Fisher 1992, and republic/USSR ratios are obtained from IMF/IBRD/OECD/EBRD 1991.

and are particularly underdeveloped in the former Soviet states where public provision of all services continues to dominate. The dependent variable in the regression analysis indicates the level of service activity and is measured by the service share in value added and employment.

The regressions are performed on panel data sets, with OECD observations available for the 1960s, 1970s and 1980s and "world economies" observations available for the 1970s and 1980s. The panel dimension of the data does not add much to the exercise, since most of the variation is across countries rather than time. We therefore use decade averages rather than annual observations; and the decade average coefficients can be used to assess whether there were shifts in the levels of activity over time. Where the coverage of sub-sectors in the Soviet data differs from the OECD and "world economies" classifications, we typically bias the Soviet data against the hypothesis of smaller service sectors by using broader categories.

The regression results are shown in Table 1 and Figures 1-25 (see also the accompanying Notes to Figures). Table 1 shows the residuals -- or differences in actual and expected employment shares -- for Russia and other republics in a regression with "world economies" data. (Individual Soviet republics were included as dummy variables, which do not affect the regression line.) The table shows two columns for each category of economic activity. The first column shows the estimated gap in service employment shares over the whole period. A positive number indicates that actual shares were above expected shares based on international norms and a negative number indicates that actual shares were below expected shares. The second column shows the shift from the 1970s to the 1980s. Here, a positive number indicates a shift toward international norms, which are higher; and a negative number indicates a shift away from international norms.

The table shows that, with the exception of transport and communications, residuals are negative, and generally strongly negative. The other regressions are performed on non-Soviet data, with Soviet data --either aggregate or disaggregated by republic -- introduced in Figures 1-25 for comparative purposes.

Value added

The share of total services in GDP is shown as a scatter against income in Figures 1 and 2, which respectively include and exclude military personnel. As explained earlier, each observation is a decade average, with the time period in the OECD comparisons covering the 1960's, 1970's and 1980's. Typically, the 1960's observation is the furthest to the left, indicating lower per capita income; and the 1980's observation is the furthest to the right, indicating higher per capita income. In both figures, the USSR shows up as having a lower share of total services than expected, along with its fellow planned economy Yugoslavia. It would be necessary to reduce the estimate of USSR per capita income to that of Turkey to make its total service sector conform to the international pattern.¹⁴ As described below, there is substantial variation in sub-sector activity levels.

Infrastructure. Figure 3 shows a comparison of the Soviet transportation share with the OECD category "transportation and storage", while Figure 4 shows the corresponding scatter for communications. The Soviet transport share is well above OECD norms, while the communications share is below OECD norms. The inclusion of storage in the OECD data makes the higher Soviet transport shares even more striking, although value added from storage is probably small. The

¹⁴ Of course, declines in GDP in recent years have resulted in dramatic falls in per capita incomes in Russia and other former Soviet states; but the analysis here predates this phenomenon.

combined Soviet transport and communications sector (not shown) is also above average.

Business and consumer services. Figures 5 and 6 show that the Soviet trade share in value added is far below OECD norms, where the latter are defined with and without restaurants and hotels. The share of Soviet banking and insurance in value added is close to zero, as shown in Figure 7. Figures 8 and 9 show a comparison of consumer services (repair, recreation, culture). Some OECD data include housing, and some do not. Therefore, USSR data are shown with and without housing. When housing is included, the USSR lies above the regression line; but when housing is excluded, it lies below the line. This is because the housing share in value added is large in the USSR -- about 5 percent of GDP.

Public services. Figures 10, 11, 12, and 13 compare the share of public services value added in the USSR and OECD. Figure 10, which includes wages of military personnel for the USSR and most OECD countries, shows that the Soviet share of public services was higher than OECD norms in the 1960s but that it dropped slightly below international norms in the 1970s and 1980s. The exclusion of military personnel (Figure 11), science personnel (Figure 12) and both military and science personnel (Figure 13) in the Soviet data substantially reduces the Soviet public services share.

Conclusion: Soviet value added shares of trade, communication, banking and finance, consumer services excluding housing, and public services excluding science/military personnel are substantially below -- and in some cases far below -- international norms. As a result, even though some activities, such as transport and housing, have higher value added shares, total services play a much smaller role in the Soviet economy than they do in OECD countries. Above-norm

sector shares may indicate some scope for efficiency gains, whereas below-norm shares may indicate sources of growth.

The data illustrated in these figures indicate that the value added shares of transport, trade, and banking/insurance are relatively constant for a wide range of developed countries, as measured by per capita income, while the shares of communications and public services -- increase. Only the share of consumer services declines with rising incomes. Total services clearly increase with per capita income. Thus, future growth in total services' value added in Russia and the other former Soviet states will arise from increasing incomes as well as from closing the service gap.

Employment¹⁵

We next compare data for Russia, the other 14 former Soviet republics, and the USSR on employment with the two alternative international data sets described in Section B: OECD and "world economies". The former is much more detailed, while the latter contains a larger sample and provides more natural comparators to some of the poorer Soviet republics. Figures 14 and 15 compare total service sector employment shares in the former Soviet states with employment shares in the "world economies" and OECD respectively. Soviet republics are identified with the appropriate two-letter abbreviation while other countries are just shown as asterisks. Soviet republics are consistently below international norms in Figure 14; however, they conform to the norm in Figure 15. As with the analysis of value added shares, sub-sectoral employment shares of Soviet republics show quite clear patterns in relation to international norms.

¹⁵ Because of problems of data availability, the employment results are reported just for the initial years of each decade (i.e. 1970 and 1980). The Soviet data used for comparison are taken from Appendix Table 3 for the same years to match.

Infrastructure. Figures 16 and 17 show scatter diagrams of the transport and communication employment share against per capita incomes in the "world economies" and OECD respectively. As in the case of value added, there is no relationship between this share and incomes. Almost all the Soviet republics lie above the norm for infrastructure services, and Kazakhstan, Estonia, and Russia head the list. In Figure 17, only Norway and Iceland are comparable. Tadzhikistan, Uzbekistan, Armenia, and Moldova are the Soviet republics with the lowest infrastructure employment shares and are about at the "world economies" and OECD averages.

Business and consumer services. Figure 18 shows the scatter diagram for the wholesale and retail trade employment share in "world economies". The former Soviet republics are far below international norms for comparable levels of income. There is the usual problem that the international data include restaurants and hotels, while the Soviet data include only restaurants. Thus, we compare the Soviet trade data to OECD data for trade, restaurants, and hotels in Figure 19 and to OECD data for wholesale and retail trade only in Figure 20. Figure 19 shows trade services in the Soviet republics to be substantially below OECD norms; Figure 20 shows them to be only slightly below OECD norms. Unlike value added, there is a slight tendency for trade employment shares in the Soviet republics, as well as in OECD countries, to rise with per capita income.

Figures 21 and 22 compare the banking and insurance employment shares in the Soviet republics with "world economies" and OECD employment shares respectively. Employment in the Soviet financial sector is far below international norms by either measure, with the gap increasing as incomes rise. In Figure 23, we compare Soviet data on community services, which include housing services, with OECD data on consumer services, which here exclude housing as well

as privately-provided health and education services. Despite the inclusion of housing in the USSR data, making it broader, Soviet shares drop precipitously below OECD norms as income rises.

Public services. Figure 24 shows the sum of government, health, education, and science employment shares for the Soviet republics compared to the sum of the OECD categories for government services and social and related community services (the latter is mainly health and education). The inclusion of science is problematic since it is not clear how much of this category is included in the OECD figures; we therefore also show Figure 25, which excludes science in the Soviet data. Defense is included under government services in both sets of accounts; and the large Soviet defense establishment must be a major factor in explaining why Soviet employment shares are above those for the OECD at their income level in both cases.

End Use

Another way to define the role of services in the economy is by the share of services in end use. For this analysis, we rely on comparisons of real activity levels generated by Heston and Summers (H&S) under the UN International Comparison Program (ICP). The focus here is on household consumption because H&S include all education and health services in household consumption and assume no services are used in investment, private or public. The H&S international comparison of household consumption of services is described in a recent paper (Heston and Summers 1992), which is also included in Griliches 1992; it is explained below and used as a reference comparator for the Soviet data. H&S only treat services at the aggregate level; so it is not possible to draw conclusions at the sub-sector level.

The H&S study is based on a sample of 60 ICP countries for 1980. Using this data, they estimate two share variables: SC (consumer services as a proportion of total household consumption) and SGDP (consumer and government services as a proportion of GDP).¹⁶ These shares are estimated at two sets of prices: nominal market prices observed in each country and a set of international (real) prices applied uniformly to all countries.

The actual data and expected levels of SC and SGDP -- where expected levels are estimated on the basis of PPC-based per capita income -- are presented in Table 2. Table 2A gives data for the USSR for several different years, and Table 2B gives data for Russia and the other republics in 1990. In all cases, expected levels are far above the actual levels. Indeed, the actual Soviet levels of SC and SGDP at market prices are mostly below the estimated intercept of the equations. When compared at market prices, the actual levels of SC and SGDP are estimated at 10 to 20 percent of GDP below expected levels. When compared at factor costs, actual levels are estimated at 5-10 percent of GDP below expected levels. Since final services are defined to include both privately and publicly provided services like education and health and since Soviet public services -- reflected in the value added and employment comparisons described earlier -- are typically high, it can be concluded that the actual level of Soviet private consumer services is far below the expected level.

Although the Soviet republic data in Table 2B are ordered by level of GDP per capita, there is no clear pattern. Nevertheless, several observations can be made. Among the republics with higher than average incomes, such as the

¹⁶ H&S also define an "augmented consumer services" variable to capture trade and freight transportation services for consumer goods, estimated from input-output table coefficients. We have not tried to reproduce this variable with Soviet data.

Baltic republics, the actual shares of services in consumption are typically lower than average. Among the republics with lower income levels, some have very high shares -- Tadjikistan, Armenia, and Turkemenistan -- and some have extremely low shares: - Uzbekistan, Azerbaijian, Georgia, and Moldova. The republics clearly do not conform to the international patterns estimated by H&S. More study of the data and the sources of these differences is needed.

Actual data for Russia and other Soviet republics on the share of household consumption in GDP show the familiar decline with increasing incomes, reflecting the fact that, at higher incomes, societies can afford to devote more resources to investment and growth. The decrease in the consumption ratio partly offsets the tendency for service shares in consumption to increase as income rises, with the result that the share of services in GDP increases only moderately with incomes. Also, the typical Soviet consumption share is between 50-55 percent of GDP, while the typical share for lower-income European countries is above 60 percent. Thus, the low share of actual services in GDP reflects not only a low share of services in consumption but also a low share of consumption in GDP.

D. Services as a Major Source of Growth

In Section A, we set forth a view that services, and in particular business and consumer services, could be a major source of growth in Russia and other former Soviet states in the coming years. This view was based on two phenomena-- the existence of a large gap in service activity, which will be closed with the transition to a market economy, and the existence of externalities arising from the contribution made by services to productivity increases in the goods sector. Two additional types of externalities would appear to be particularly applicable to economies in transition. One is the potential contribution to consumer

welfare, through the provision of quality improvements and time-saving consumer goods and services, whose values are not captured by the national accounts. And the other is the leading role services play in systemic change.

There are several aspects to this role in systemic change. One is the provision of a market infrastructure by the expansion of trading activities, including import/export trade. Such activities must replace the old centralized allocation and distribution systems which have deteriorated fast. Competitive trading activities can reduce the costs of transactions and can facilitate backward and forward linkages in production. It is perhaps obvious that the creation of a market infrastructure during stabilization is particularly important, as other forces are discouraging supply.¹⁷ A second aspect is the role that services can play as a testing ground for beginner entrepreneurs, who are creating a new small business sector.¹⁸ In most services, especially business and consumer services, investment requirements are low. A third aspect, employment generation, is a by-product of the other two. Employment absorption will be particularly important for white collar workers with high levels of education--a majority of whom will be women.

The gap between expected and actual levels of service activity in Russia and other former Soviet states can be used to provide a comparative statics simulation of the potential contribution of services to value added and employment as these countries move toward a market economy. Expected levels of service activity are estimated from the pooled cross-country OECD and "world economies" data; and the percentage differences from the actual data are applied

¹⁷ Lipton and Sachs 1990 and 1992 provide some evidence on these points.

¹⁸ For a study of new private service firms in Russia, see de Melo and Ofer 1994.

to 1990 levels of value added and employment. Table 3 indicates the potential contribution of services to value added in the USSR in 1990 for each of the sub-sectors discussed earlier; and Table 4 indicates the potential employment generation of services for Russia and each of the other former Soviet states.

The simulation results in Table 3 show that expected direct value added for total services is 43 percent higher than the actual level, and this is without accounting for any of the externalities discussed earlier. The additional income generated by this difference -- about 120 billion rubles in 1990 current prices -- could increase GNP by more than 10 percent and compensate for displacement effects in other parts of the economy, such as a drop in military and heavy industry production. The trade and consumer services sub-sectors would generate the most income, as they are relatively large and the gaps between actual and expected levels are also large.

For employment, the simulation results in Table 4 show that closing the gap would generate a total of 6 million extra jobs for the USSR in 1990, with close to 3 million jobs created in Russia alone. The employment gap is large, and employment generation from closing the gap in services could compensate for an overall unemployment rate of close to 3 percent. Additional research is required on the likely time period for convergence between the actual and expected levels of service activity and the likely sequence of convergence of different sub-sectors.

A Policy Agenda for Russia and Other Former Soviet States

In view of the above potential, it will be important for Russia and the other former Soviet states to identify a policy agenda to facilitate the rapid expansion of services. Traditionally, the Marxist doctrine of socialist economies has labeled services "non-productive". And there is continuing

evidence that national policies discriminate against producers of services as distinguished from producers of goods. For example, in Russia, there was until recently a 25 percent ceiling on trade margins for some products, and the enterprise profits tax is reduced for producers of goods but not for producers of services. Also, coefficients for real estate lease payments are sometimes higher for service firms.

The policy agenda should entail economic, legal, and institutional changes to eliminate the current bias against services, so that service firms can compete on a level playing field. It should also include proactive programs to stimulate a rapid increase in the level of service activity. Appropriate measures may include changes in the tax law, the regulatory framework, and other economic incentives; government programs to accelerate private sector development and privatization of government distribution and service activities; training for enterprise employees to facilitate their transfer from production to service activities; action to support the orderly development of input and output markets; creation of a modern banking system that will use appropriate criteria to provide credit to service enterprises; and consideration of service activities as priorities for international technical assistance and direct foreign investment. The little experience with private services in the former Soviet states and the historical negative view of the role of services there both argue for a strong involvement of the international community in services.

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Table 1: Differences in Actual and Expected Service Employment Shares: 1970s and 1980s ^{a/}

(percent)

	Transport and Communication		Trade		Business, Consumer and Public Services		Total	
	1970s & 1980s	Shift in 1980s	1970s& 1980s	Shift in 1980s	1970s & 1980s	Shift in 1980s	1970s & 1980s	Shift in 1980s
	USSR	1.8	1.0	-6.8	-0.3	-9.8	-3.1	-10.6	-0.1
Estonia	2.7	0.5	-6.7	-0.2	-10.5	-2.4	-11.0	0.3
Latvia	2.4	0.6	-6.7	0.1	-11.1	-2.4	-11.3	0.4
Russia	2.3	1.0	-6.8	-0.4	-10.0	-3.7	-9.1	-0.5
Belarus	0.5	1.5	-7.5	-0.1	-11.1	-2.9	-16.7	1.2
Lithuania	0.7	0.9	-8.0	-0.7	-11.7	-1.7	-16.5	2.4
Ukraine	1.2	0.7	-6.7	-0.4	-11.7	-2.7	-13.5	0.4
Moldova	-0.9	1.4	-7.6	0.4	-11.2	-1.7	-19.0	2.0
Armenia	0.3	0.2	-6.8	-1.2	-7.1	-3.3	-8.9	-2.2
Georgia	1.1	1.0	-7.3	-0.6	-7.6	-2.2	-10.0	1.0
Kazakhstan	4.0	1.2	-5.9	-0.5	-6.8	-3.3	-5.2	-1.0
Azerbaijan	1.7	0.9	-6.1	-1.0	-5.8	-3.71	-6.6	-2.5
Turkmenistan	0.2	1.1	-5.1	-1.0	-6.5	-3.6	-7.7	-2.9
Kyrgyzstan	0.9	0.4	-6.1	-0.4	-5.9	-3.1	-8.6	-1.3
Uzbekistan	-0.2	0.9	-5.9	-0.4	-6.8	-1.9	-10.7	-0.1
Tadzhikistan	-0.3	0.8	-6.8	-0.3	-6.7	-2.9	-11.5	-1.2

^{a/} Residuals from regression of service employment shares on income per capita. Republics ordered by income per capita in 1990.

Table 2: Actual and Estimated Shares of Services in Household Consumption and GDP: The USSR and 15 Republics

A. USSR		Actuals		Estimates a/ (Heston & Summers Equations)	
		SC (1)	SGDP (2)	SC (4)	SGDP (5)
Factor Costs (1970 prices)	1950	37.2	31.7	..	..
	1960	34.7	25.6	..	..
	1970	36.0	25.5	39.1	34.1
(1980 prices)	1970	34.4	24.0	39.1	34.1
	1980	35.5	26.4	41.8	35.0
	1987	36.9	26.7	43.5	35.6
Market (Established) Prices					
	1970	21.1	16.6	39.1	34.1
	1982	21.7	17.1 b/	42.1	35.1
	1987	24.1	18.5	43.5	35.6
	1990	23.8	17.7	33.8	32.2
B. 15 Republics (by order of income per capita in 1990)					
Market (Established) Prices 1990					
		Actuals (1990)		Estimates a/ (Heston & Summers Equations)	
		SC (1)	SGDP (2)	SC (4)	SGDP (5)
Estonia		20.0	13.9	33.3	39.0
Latvia		23.3	20.1	49.8	37.7
Russia		25.3	19.8	48.2	37.2
Belarus		25.0	17.7	45.8	36.4
Lithuania		14.0	20.6	43.6	35.6
Ukraine		25.0	19.2	42.3	35.2
Moldova		12.3	19.4	41.1	34.8
Armenia		29.1	23.6	40.1	34.4
Georgia		13.8	24.6	40.1	34.4
Kazakhstan		10.5	23.5	39.6	34.2
Azerbaijan		11.4	21.0	36.0	33.0
Turkmenistan		24.8	25.5	35.6	32.9
Kyrgyzstan		26.0	26.4	35.1	32.7
Uzbekistan		15.4	15.0	33.0	32.0
Tadzhikistan		29.4	27.9	32.1	31.7

a/ The Heston & Summers equations are as follows:

SC = $0.246 + 0.035$ GNP per capita (\$1000) (GDP per capita used for Soviet republics)

SGDP = $0.291 + 0.012$ GNP per capita (\$1000) (GDP per capita used for Soviet republics)

SC – Share of consumer services in household consumption (including education and health)

SGDP – Share of all services in GDP

b/ Number is interpolated by averaging 1970 and 1987.

Sources: For actuals, Joint Economic Committee, U.S. Congress, USSR: Measures of Economic Growth and Development, 1950-1980 (1982), Washington, D.C., Joint Committee Print, p. 41; Joint Economic Committee, U.S. Congress, Measures of Soviet Gross National Product in 1982 Prices (1990), Washington, D.C., Joint Committee Print, p. 26; Albina Tretyakova, USSR: Gross National Product Accounts by Republic, 1987 (1992), Washington, D.C., Center for International Research, U.S. Bureau of Census, p. 169; World Bank data (Dmitri Steinberg), 1992. For estimates, Alan Heston and Robert Summers, "Measuring Final Product Services for International Comparisons," mimeo (1992).

Table 3: GDP Growth Potential from Services in the USSR: Counterfactual Estimates for 1990

Sector	(1) <i>Equation Residual</i> (%)	(2) <i>Additional</i> <i>GDP a/</i> (billion rubles)	(3) <i>Additional GDP as</i> <i>% of Present GDP in Sector</i>
OECD Equations			
Total Services	-10.8	120.9	43.3
Transportation	3.2	-34.0	-32.4
Communication	-0.3	3.4	30.4
Trade	-5.9	63.5	76.0
Banking & Insurance	-2.8	30.3	1033.6
Consumer Services	-6.1	65.9	67.6
Public Services	-1.4	15.1	14.0
Discrepancy b/	2.4	-23.2	-1145.9

a/ Total GDP for 1990 = 1,085 billion rubles according to World Bank data (Dmitri Steinberg), 1992

b/ The discrepancy is created due to inconsistencies in the scope of individual sectors between the USSR and OECD.

Source: Authors' calculations based on regression analysis.

Table 4: Labor Absorption Potential from Services in the USSR and 15 Republics: Counterfactual Estimates for 1990

A. USSR

Sector	(1) Residual for Services (%)	(2) Additional Employment in Services for USSR (millions)	(3) Additional Employment as % of Present Employment in Services (%)	(4) Additional Employment in Services for Russia (millions)
(1) World Economics Equations				
Total Services	-10.6	6.0	10.6	2.8
Transportation & Communication	1.8	-0.2	-1.8	-1.2
Trade	-6.8	0.7	6.8	0.4
All Other Services	-9.8	3.5	9.8	2.0
Discrepancy a/	4.2	2.0	..	1.7
(2) OECD Equations				
Total Services	-4.3	2.5	4.5	
Transportation & Communication	2.3	-0.2	-2.3	
Trade	-5.3	0.6	5.3	
Banking & Insurance	-9.0	0.1	9.0	
Housing-Communal Services	-3.5	0.7	3.5	
Public Services	9.0	-1.4	-9.0	

a/ The discrepancy is created by inconsistencies in the scope of individual sectors between the USSR and ILO.

B. 15 Republics

(ordered by income per capita in 1990)

World Economics equation

Republic	Total Employment in Services (1990: millions)	Residual for Services (%)	Additional Employment in Services (millions)	Additional Employment as % of Services Employment (%)
USSR	56.4	-10.5	5.92	10.5
Estonia	0.3	-11.0	0.04	11.0
Latvia	0.6	-11.3	0.07	11.3
Russia	31.5	-9.1	2.86	9.1
Belarus	1.9	-16.7	0.32	16.7
Lithuania	0.7	-16.5	0.12	16.5
Ukraine	9.8	-13.5	1.32	13.5
Moldova	0.7	-19.0	0.14	19.0
Armenia	0.6	-8.9	0.06	8.9
Georgia	1.1	-10.0	0.11	10.0
Kazakhstan	3.2	-3.2	0.17	3.2
Azerbaijan	1.1	-6.6	0.07	6.6
Turkmenistan	0.5	-7.7	0.04	7.7
Kyrgyzstan	0.7	-8.6	0.06	8.6
Uzbekistan	2.8	-10.7	0.30	10.7
Tadzhikistan	0.7	-11.5	0.07	11.5

Source: Appendix Table A3 and authors' calculations based on regression analysis.

Notes to Figures

A. Share of Services in Value Added: the USSR and OECD

For OECD, value added shares are in current prices. For the USSR, 1970 factor cost prices are used for the 1960s and 1970s, and 1982 factor cost prices are used for 1980s.

- Figure 1:** *Share of Total Services (Including Military) in Value Added*
 For OECD countries, military value added is included by definition, but in practice some countries do not.
 For the USSR, Figure 1 includes only the pay for military personnel.
 Total services in the USSR also include a sector called "science and scientific services," which other countries include partly in educational services and partly in various production sectors.
- Figure 2:** *Share of Total Services (Excluding Military) in Value Added*
 Same as above, but without military personnel for the USSR.
 Note: According to the CIA estimates, payments for military personnel - only a part of value added of the defense sector - consist of about 2 percent of GNP at factor cost. The OECD defense shares had been much smaller than those of the USSR. Therefore, the two figures are shown here.
- Figure 3:** *Share of Transport Services in Value Added*
 For OECD, transport and storage are included; for the USSR, only transport.
- Figure 4:** *Share of Communication Services in Value Added*
- Figure 5:** *Share of Trade, Restaurant, and Hotel Services in Value Added*
 For the USSR hotels are not included. They are in consumer services.
- Figure 6:** *Share of Wholesale and Retail Trade in Value Added*
 Data for the USSR include restaurants.
- Figure 7:** *Share of Banking and Insurance Services in Value Added*
- Figure 8:** *Share of Consumer Services (Including Housing for USSR) in Value Added*
 Consumer services in all countries include repair, personal care, and recreation. They do not include education and health services. Some OECD data include housing, and some do not. It is usually not possible to separate out housing. Therefore, consumer services data for OECD are the same in Figure 8 and Figure 9.

- Figure 9:** *Share of Consumer Services (Excluding Housing for USSR) in Value Added*
See also note for Figure 8.
Note: The housing sector in the USSR has been highly subsidized. At established prices its share is about 0.5 percent of GDP. At factor cost, with adjustments made by the CIA, the share equals to 5-6 percent of GNP, which given the low availability of housing in the USSR is probably upward biased in the international comparison.
- Figure 10:** *Share of Government, Health, Education, Military, and Scientific Services in Value Added*
For OECD, data include all services produced by the government as well as non-government education and health services
- Figure 11:** *Share of Government, Health, Education, and Scientific Services in Value Added*
See note for Figure 10.
- Figure 12:** *Share of Government, Health, Education, Military Services in Value Added*
See note for Figure 10.
- Figure 13:** *Share of Government, Health, and Education Services in Value Added*
See note for Figure 10.

B. Share of Services in Employment: the USSR and OECD

All data refer to civilian labor force. The Soviet data are for full-time equivalent of the employed.

- Figure 15** *Share of Total Services in Employment*
- Figure 17:** *Share of Transport and Communication Services in Employment*
- Figure 19:** *Share of Trade, Restaurant, and Hotel Services in Employment*
Soviet data are without hotels. They are included in consumer services.
- Figure 20:** *Share of Wholesale and Retail Trade in Employment*
Soviet data include restaurants.
- Figure 22:** *Share of Banking and Insurance Services in Employment*
- Figure 23:** *Share of Housing and Consumer Services in Employment*
OECD data do not include housing. For employment, it is not possible to separate housing for the USSR.

Figure 24: *Share of Government, Health, Education, and Scientific Services in Employment*

Figure 25: *Share of Government, Health, and Education Services in Employment*
See notes to Figures 1 and 2 above.

C. Share of Services in Employment: 15 Soviet Republics and World Economies

World Economies data are from ILO yearbooks and include all countries for which data were available. Data are not uniform: can be for employment, labor force, total or only civilian and others. In addition, there are many differences in classification by branch. Soviet data are as above.

Figure 14: *Share of Total Services in Employment*
See also Table 1, column 4

Figure 16: *Share of Transport and Communication Services in Employment*
See also Table 1, column 1.

Figure 18: *Share of Trade, Restaurant, and Hotel Services in Employment*
See also Table 1, column 2

Figure 21: *Share of Banking and Insurance Services in Employment*

FIGURE 1: SHARE OF TOTAL SERVICES (INCLUDING MILITARY) IN VALUE ADDED:
USSR AND OECD

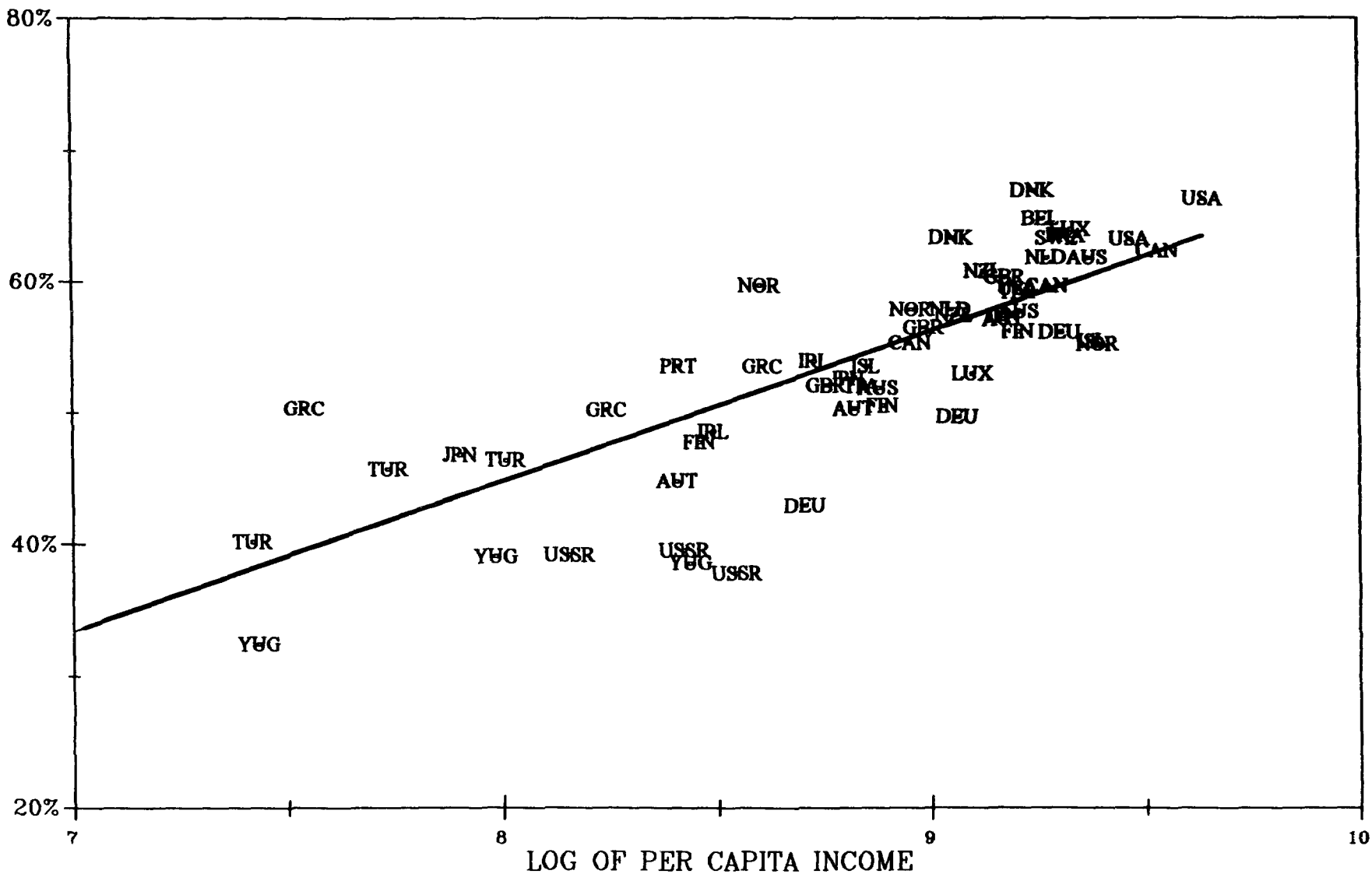


FIGURE 2: SHARE OF TOTAL SERVICES (EXCLUDING MILITARY) IN VALUE ADDED:
USSR AND OECD

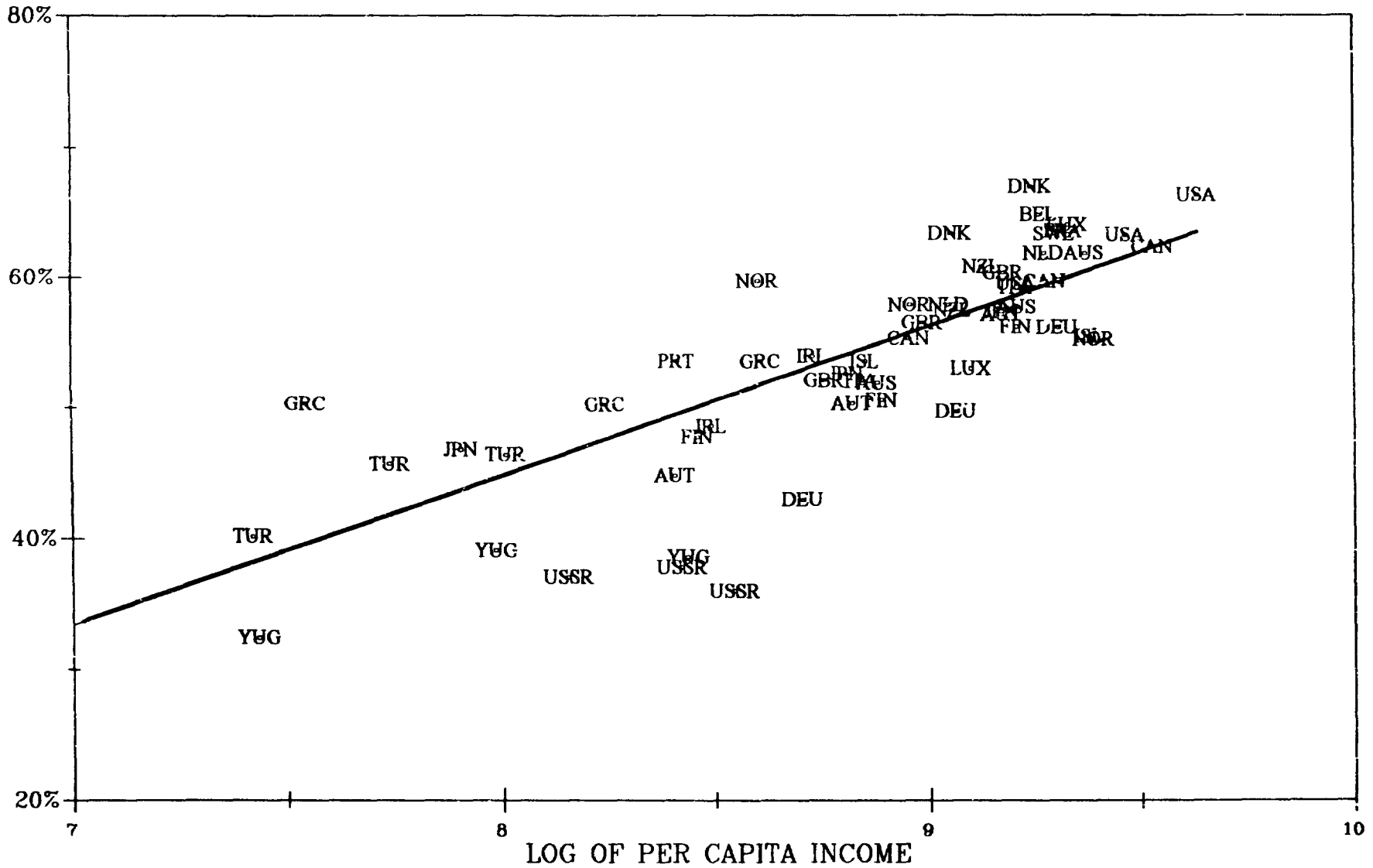


FIGURE 3: SHARE OF TRANSPORT SERVICES IN VALUE ADDED:
USSR AND OECD

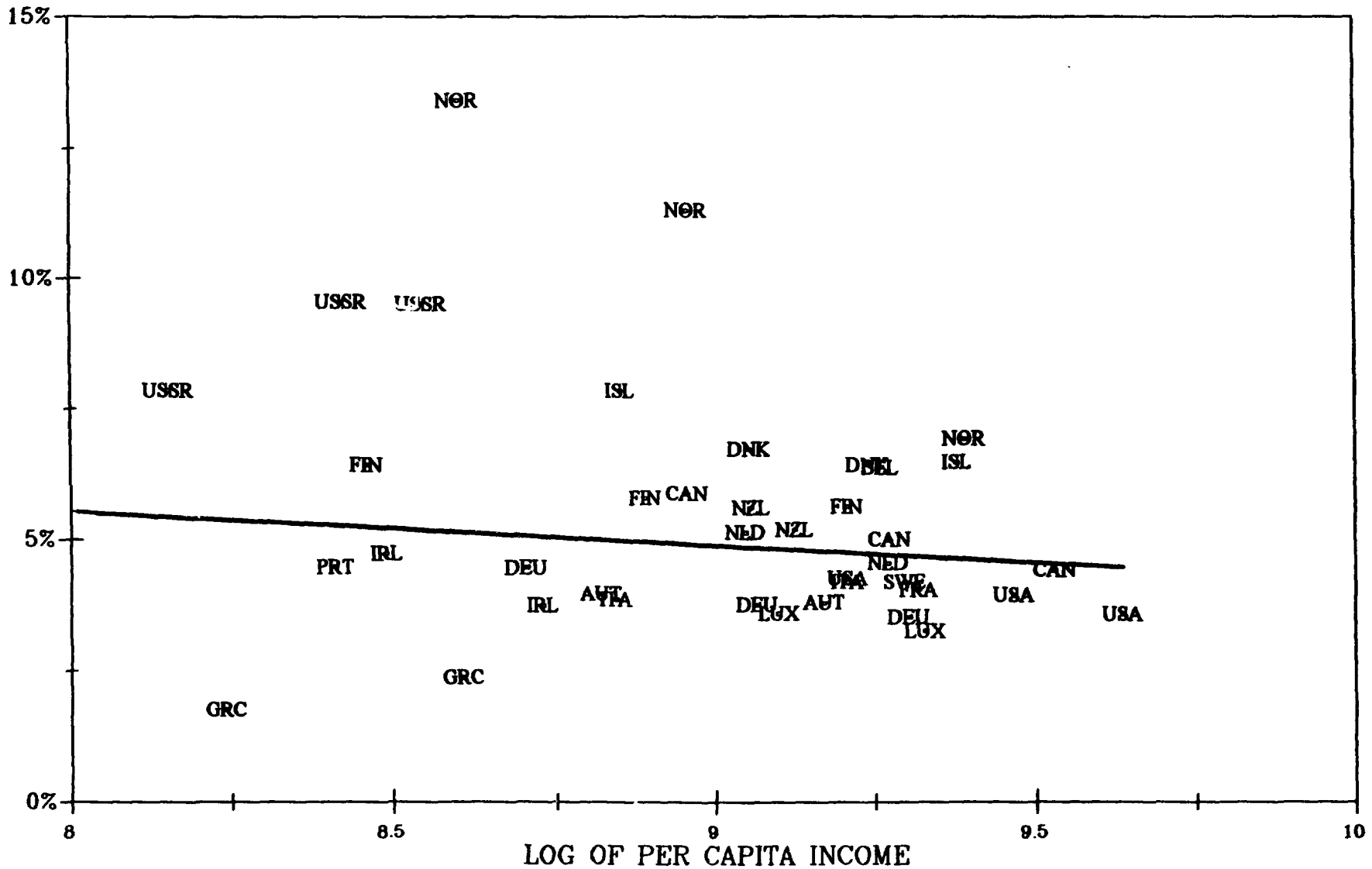


FIGURE 4: SHARE OF COMMUNICATION SERVICES IN VALUE ADDED:
USSR AND OECD

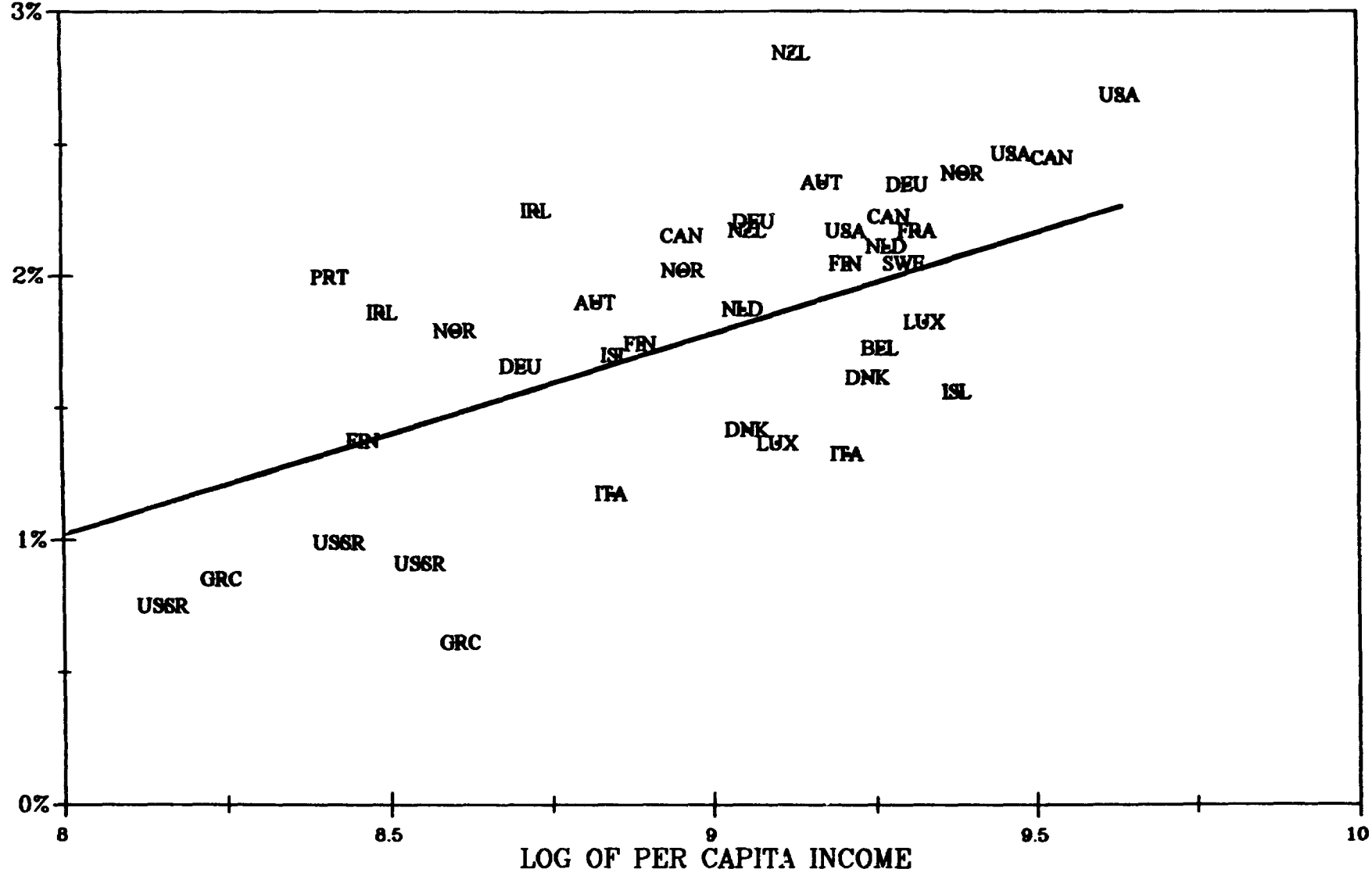


FIGURE 5: SHARE OF TRADE, RESTAURANT, AND HOTEL SERVICES IN VALUE ADDED:
USSR AND OECD

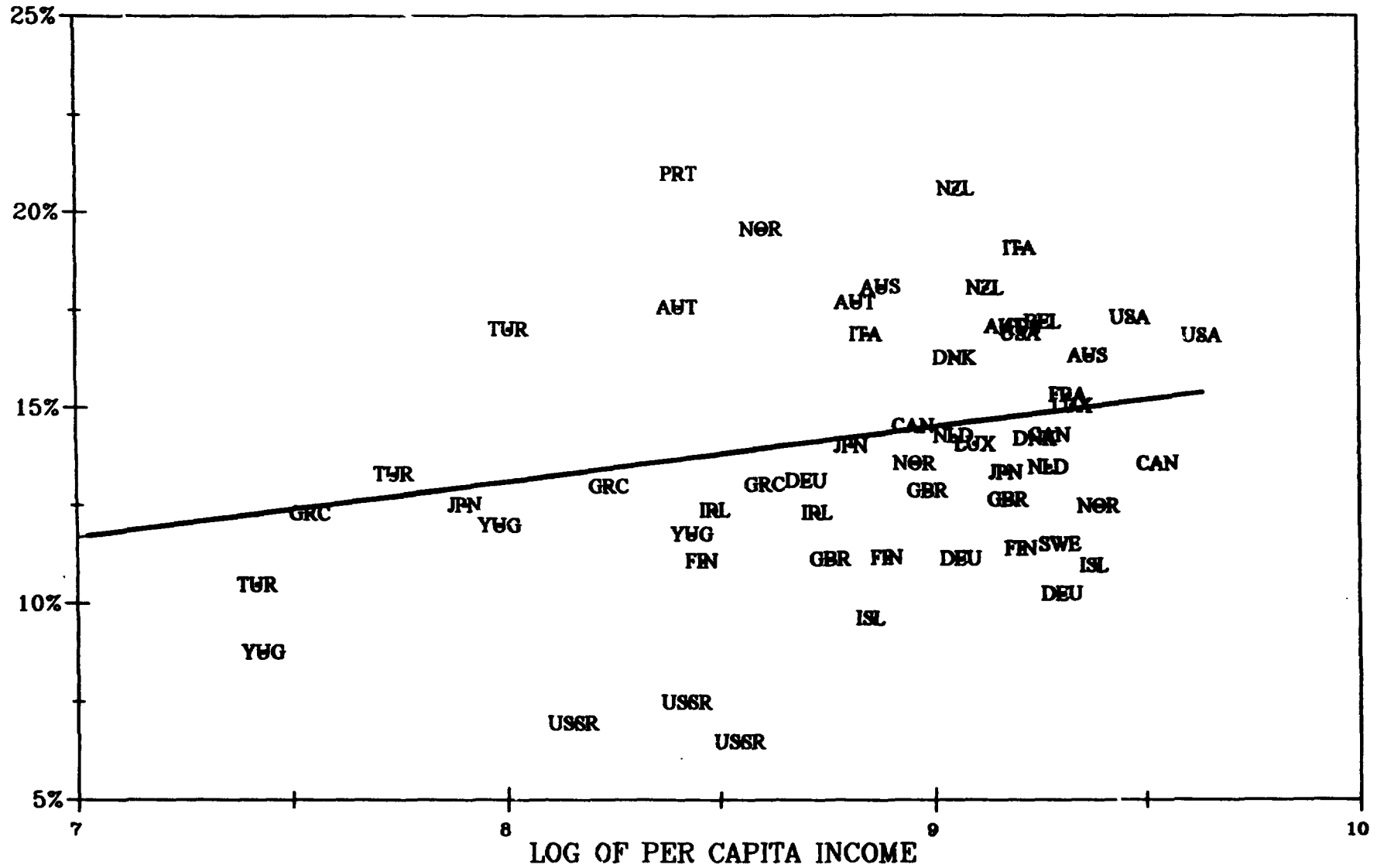


FIGURE 6: SHARE OF WHOLESALE AND RETAIL TRADE IN VALUE ADDED:
USSR AND OECD

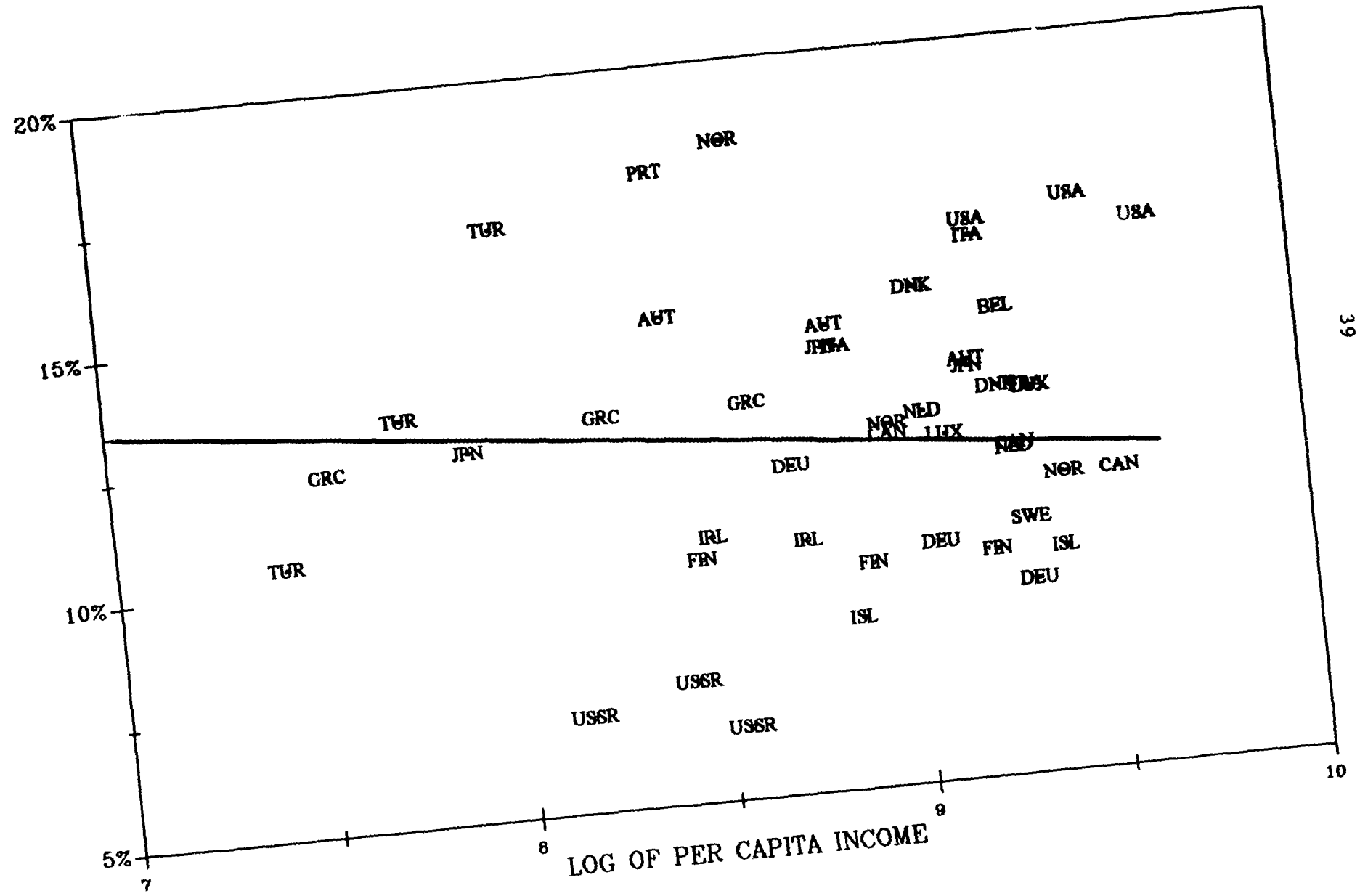


FIGURE 7: SHARE OF BANKING AND INSURANCE SERVICES IN VALUE ADDED:
USSR AND OECD

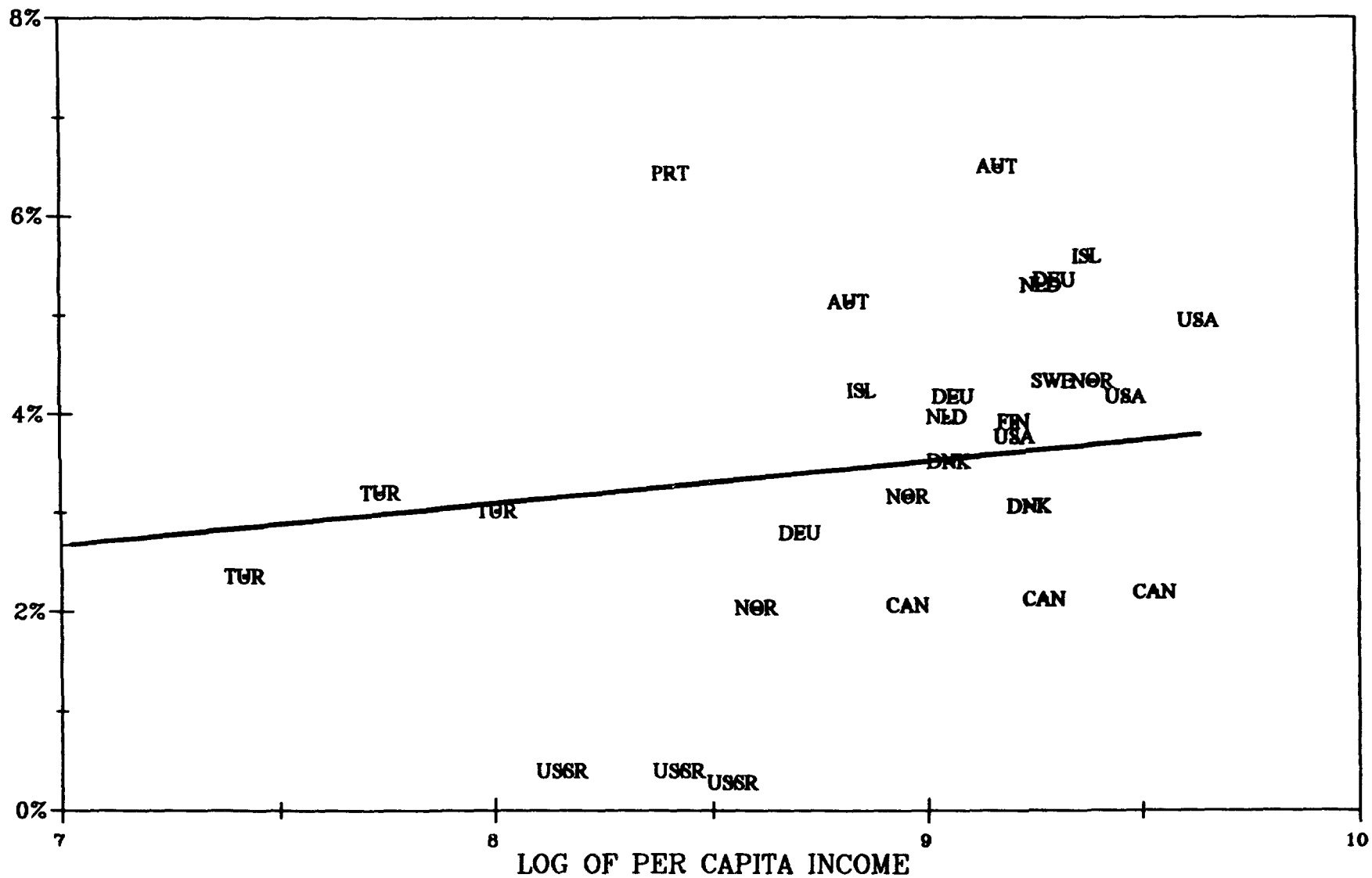


FIGURE 8: SHARE OF CONSUMER SERVICES (INCLUDING HOUSING FOR USSR) IN
 VALUE ADDED:
 USSR AND OECD

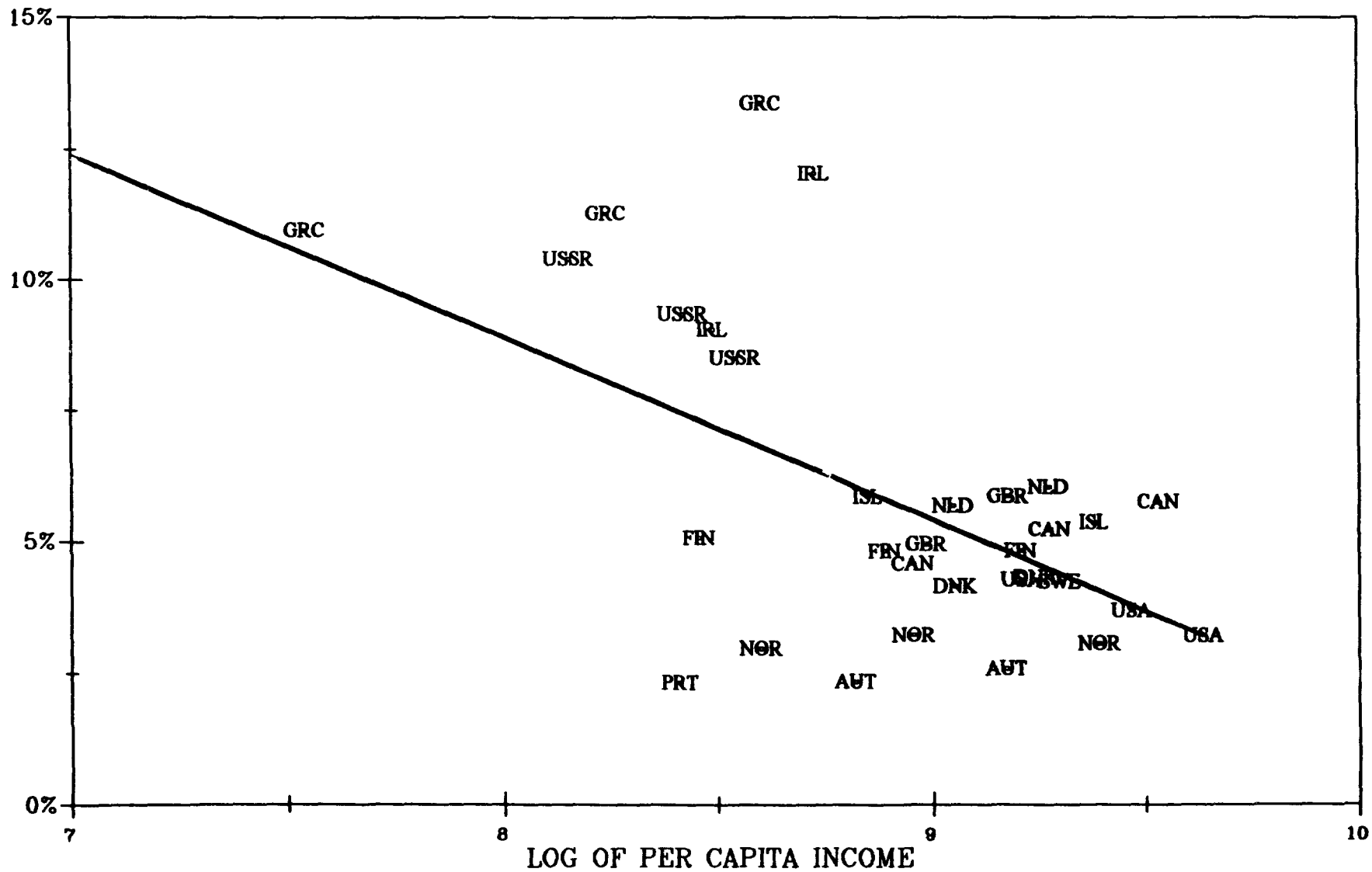


FIGURE 9: SHARE OF CONSUMER SERVICES (EXCLUDING HOUSING FOR USSR) IN VALUE ADDED:
USSR AND OECD

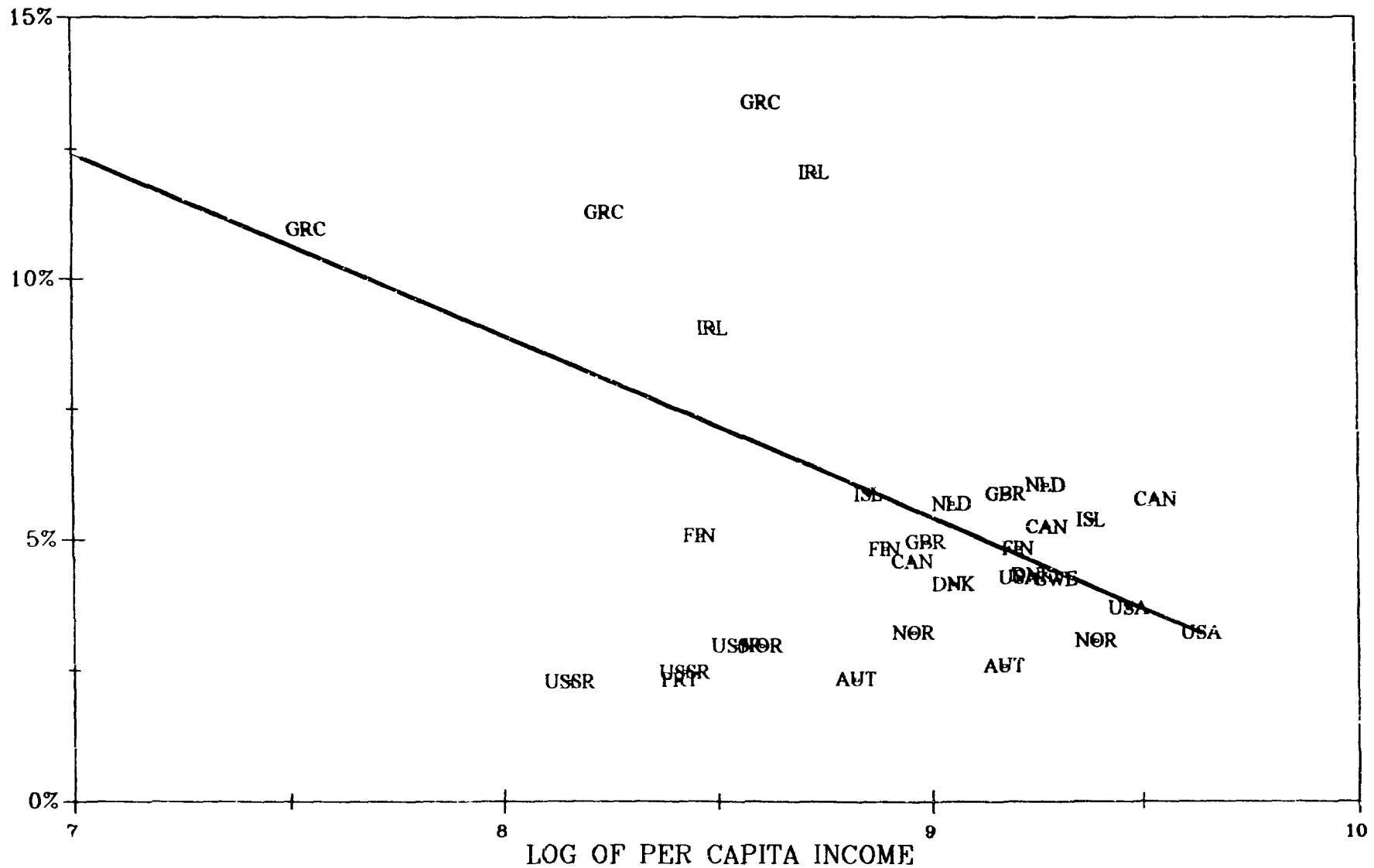


FIGURE 10: SHARE OF GOVERNMENT, HEALTH, EDUCATION, MILITARY, AND SCIENTIFIC SERVICES IN VALUE ADDED:
USSR AND OECD

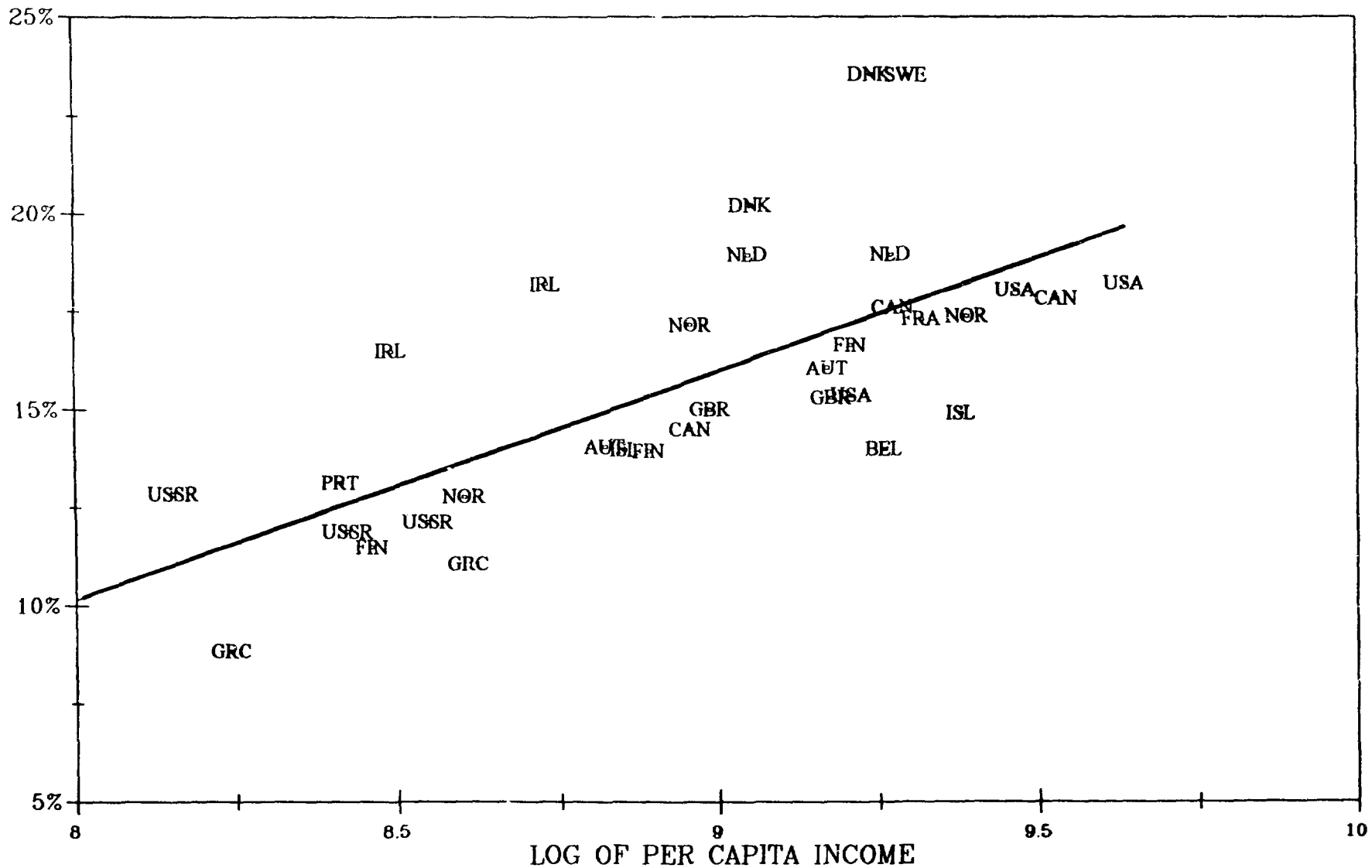


FIGURE 11: SHARE OF GOVERNMENT, HEALTH, EDUCATION AND SCIENTIFIC SERVICES IN VALUE ADDED:
USSR AND OECD

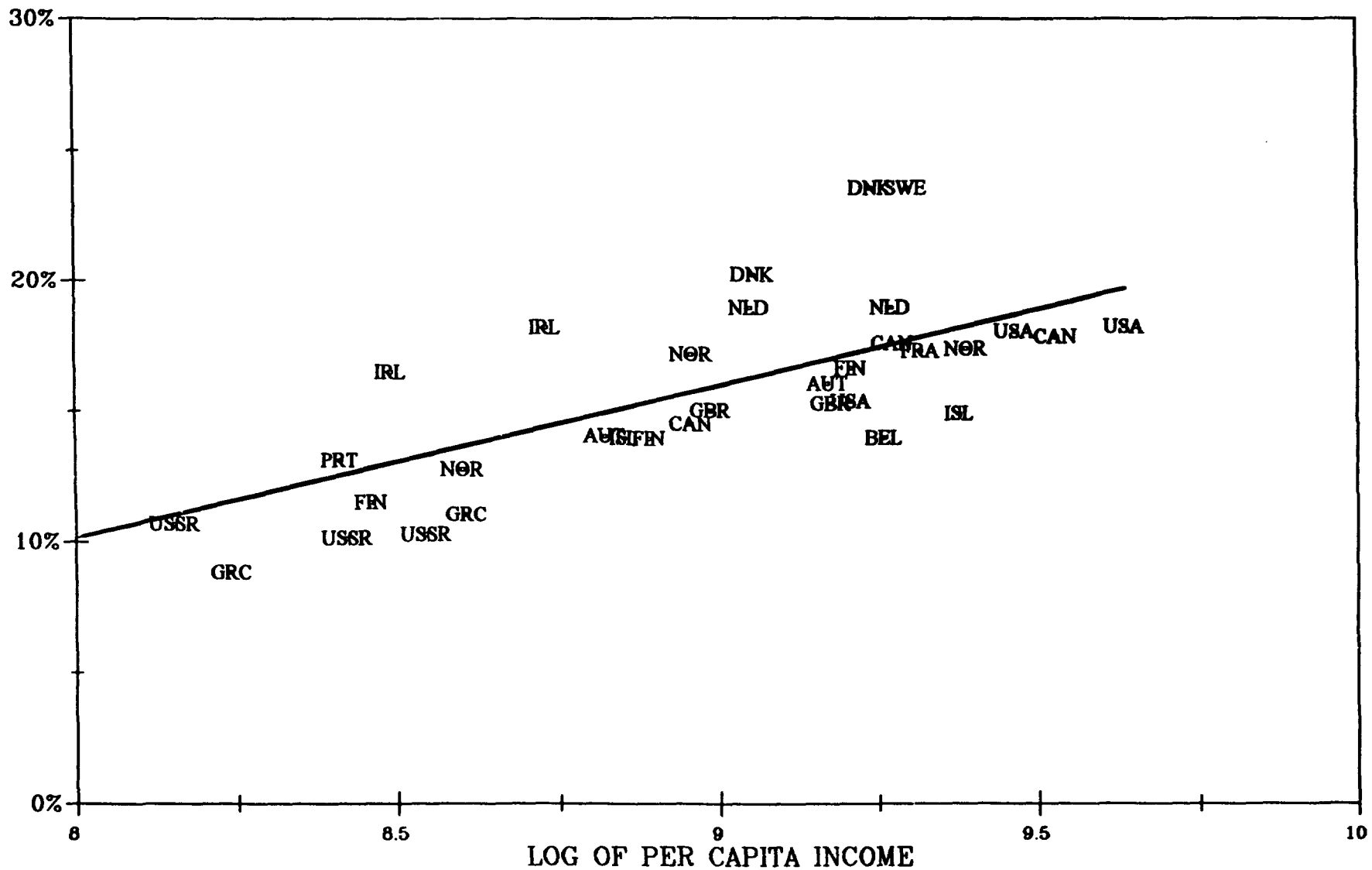


FIGURE 12: SHARE OF GOVERNMENT, HEALTH, EDUCATION. MILITARY SERVICES IN VALUE ADDED:
USSR AND OECD

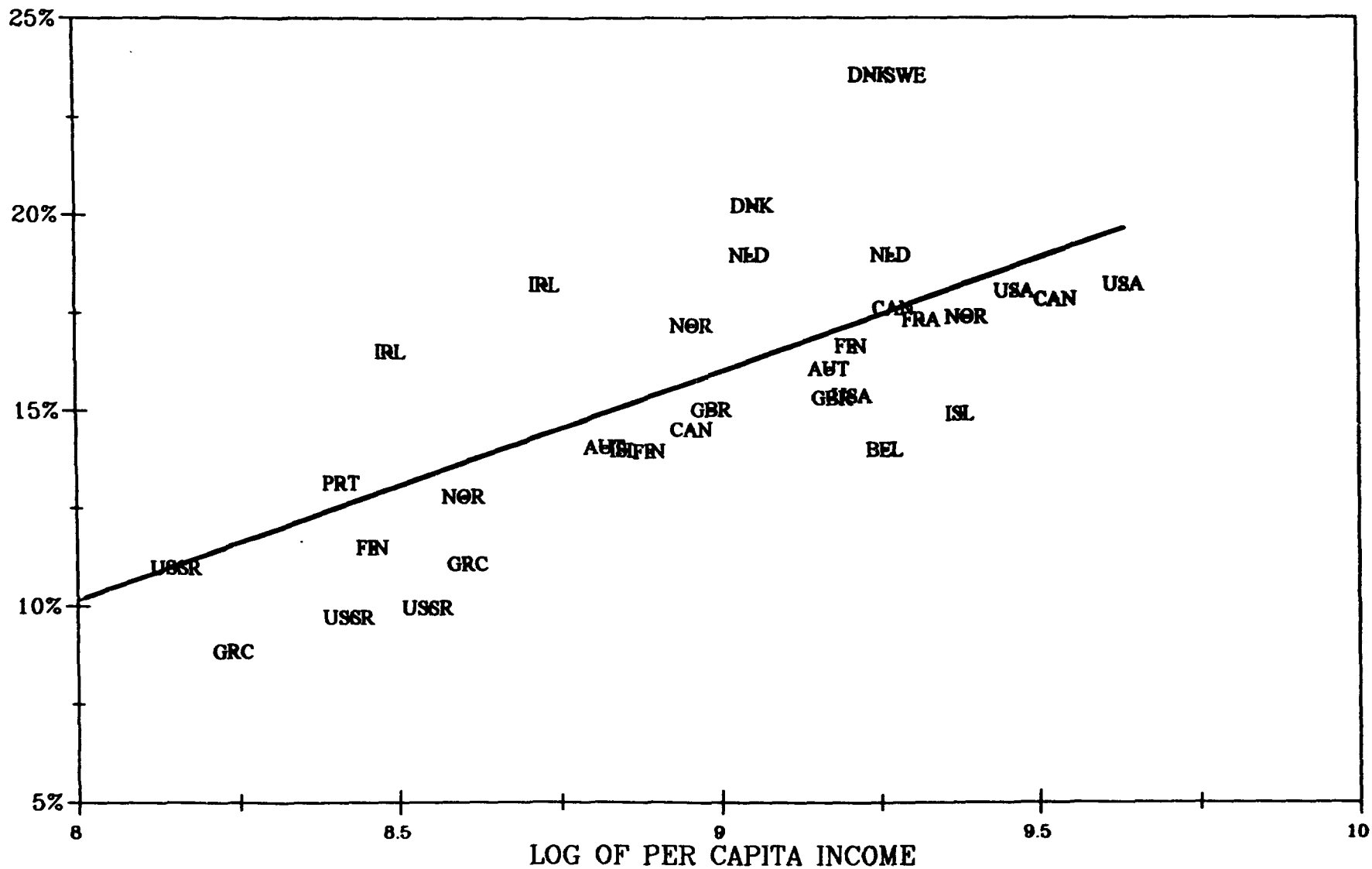


FIGURE 13: SHARE OF GOVERNMENT, HEALTH, AND EDUCATION SERVICES IN VALUE
ADDED:
USSR AND OECD

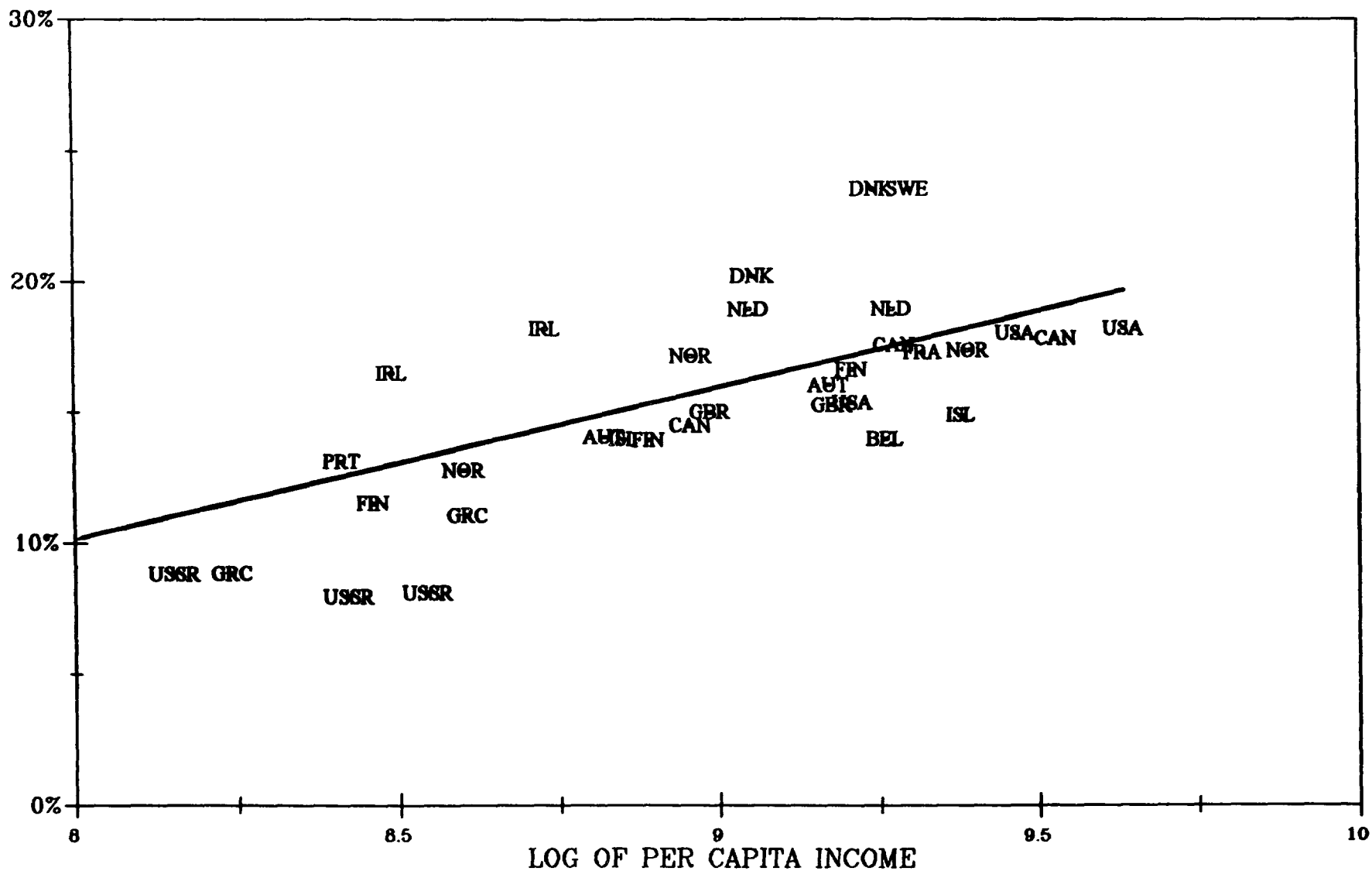


FIGURE 14: SHARE OF TOTAL SERVICES IN EMPLOYMENT:
SOVIET REPUBLICS AND WORLD ECONOMIES

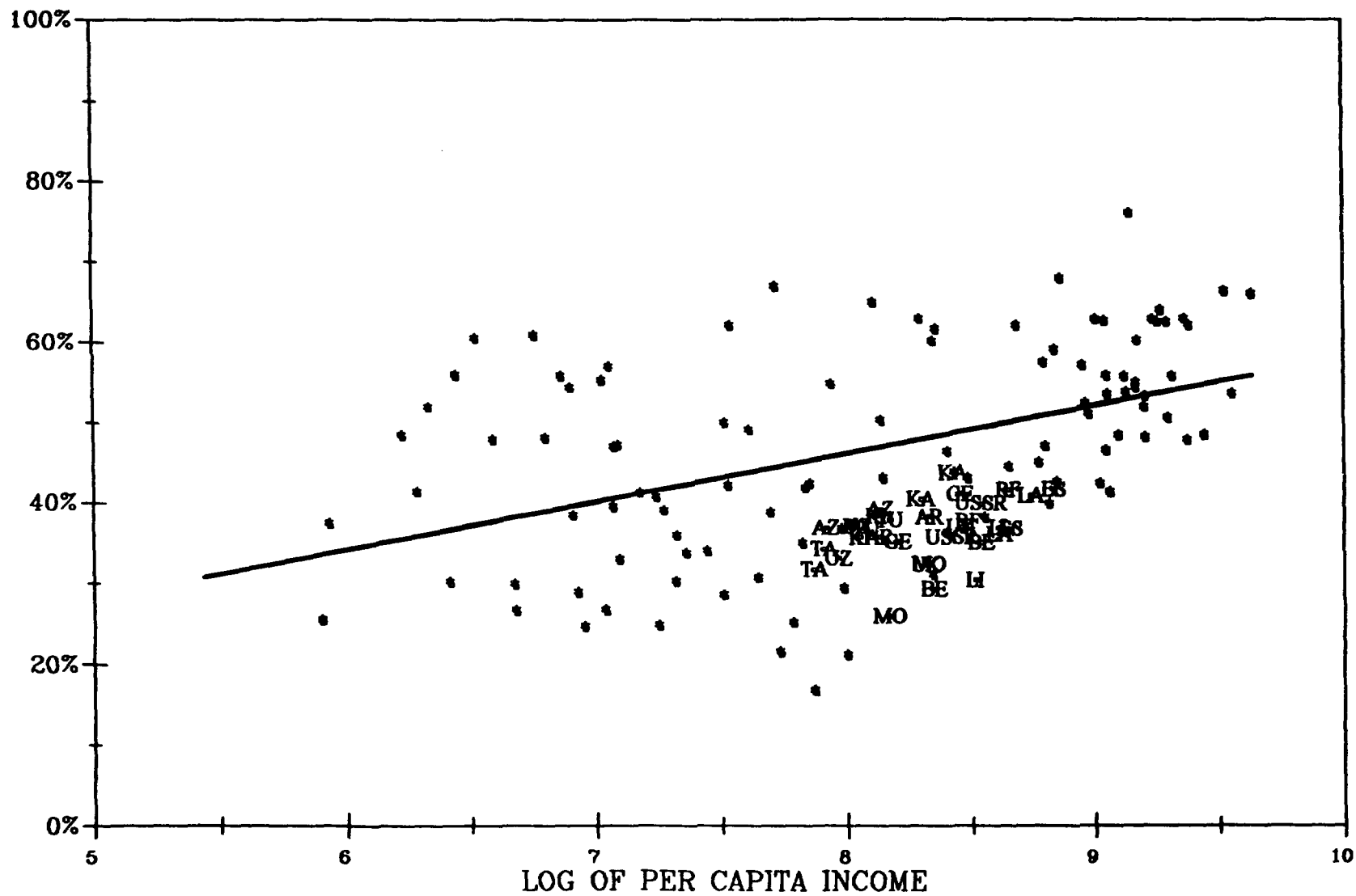


FIGURE 15: SHARE OF TOTAL SERVICES IN EMPLOYMENT:
SOVIET REPUBLICS AND OECD

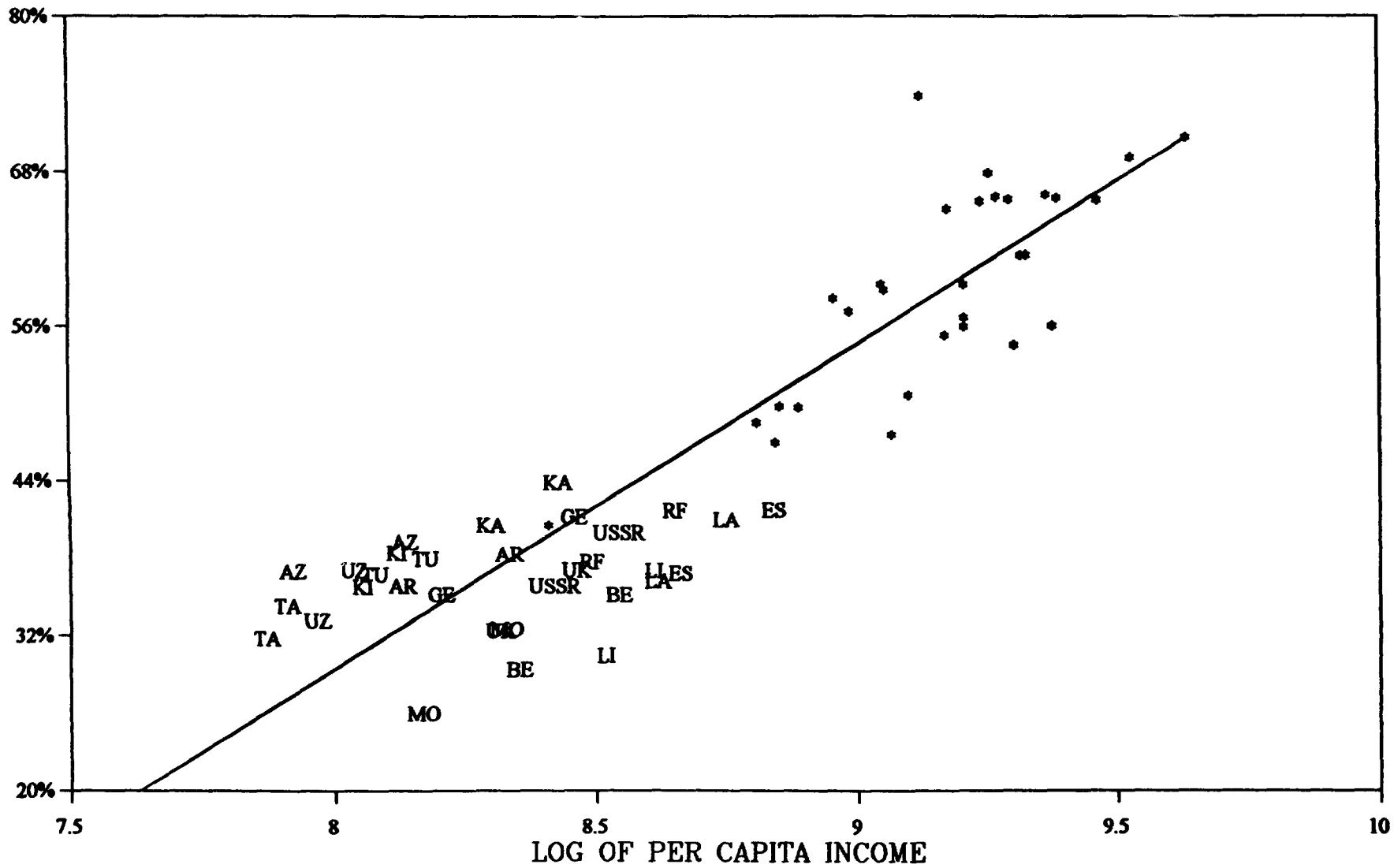


FIGURE 16: SHARE OF TRANSPORT AND COMMUNICATION SERVICES IN EMPLOYMENT:
SOVIET REPUBLICS AND WORLD ECONOMIES

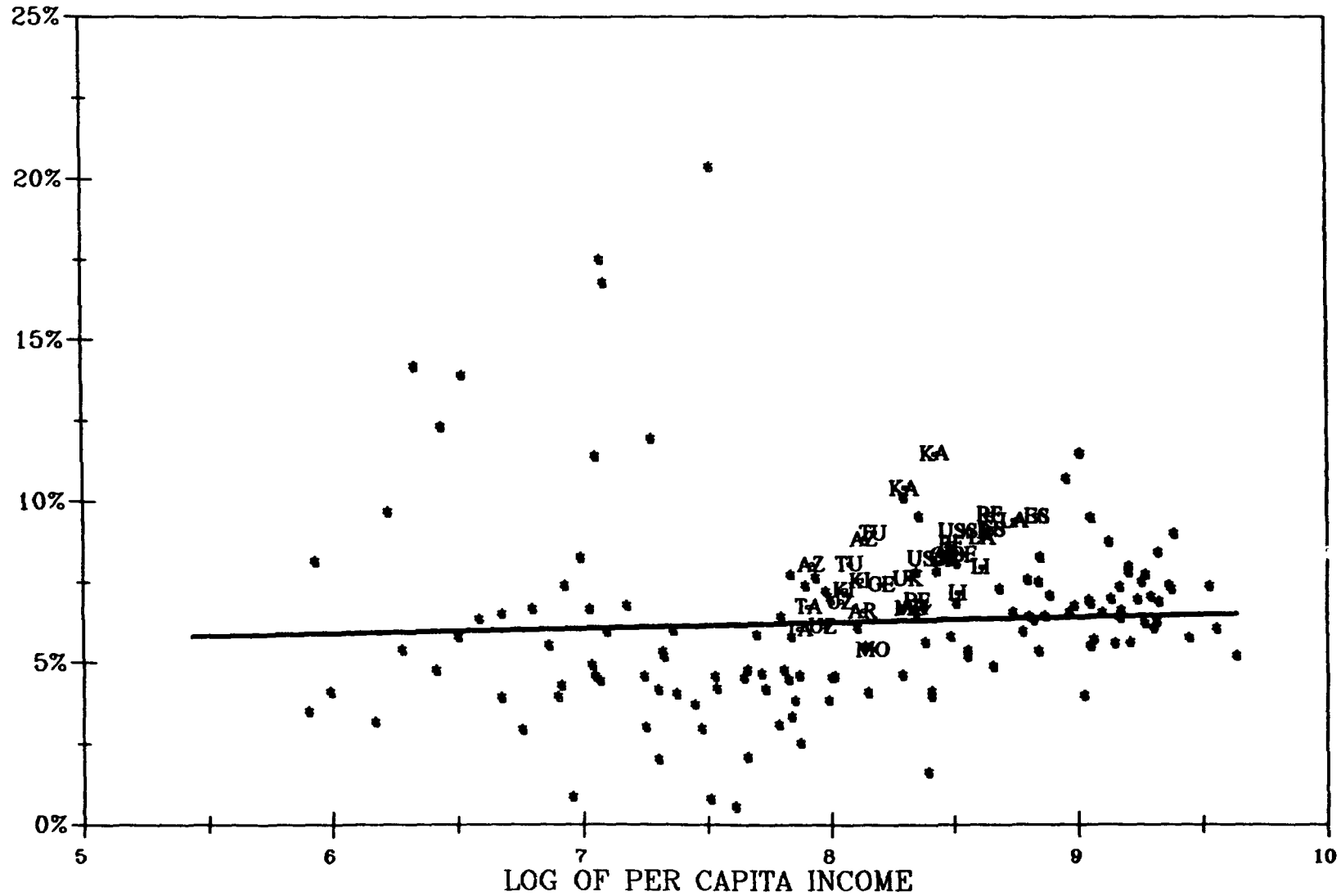


FIGURE 17: SHARE OF TRANSPORT AND COMMUNICATION SERVICES IN EMPLOYMENT:
SOVIET REPUBLICS AND OECD

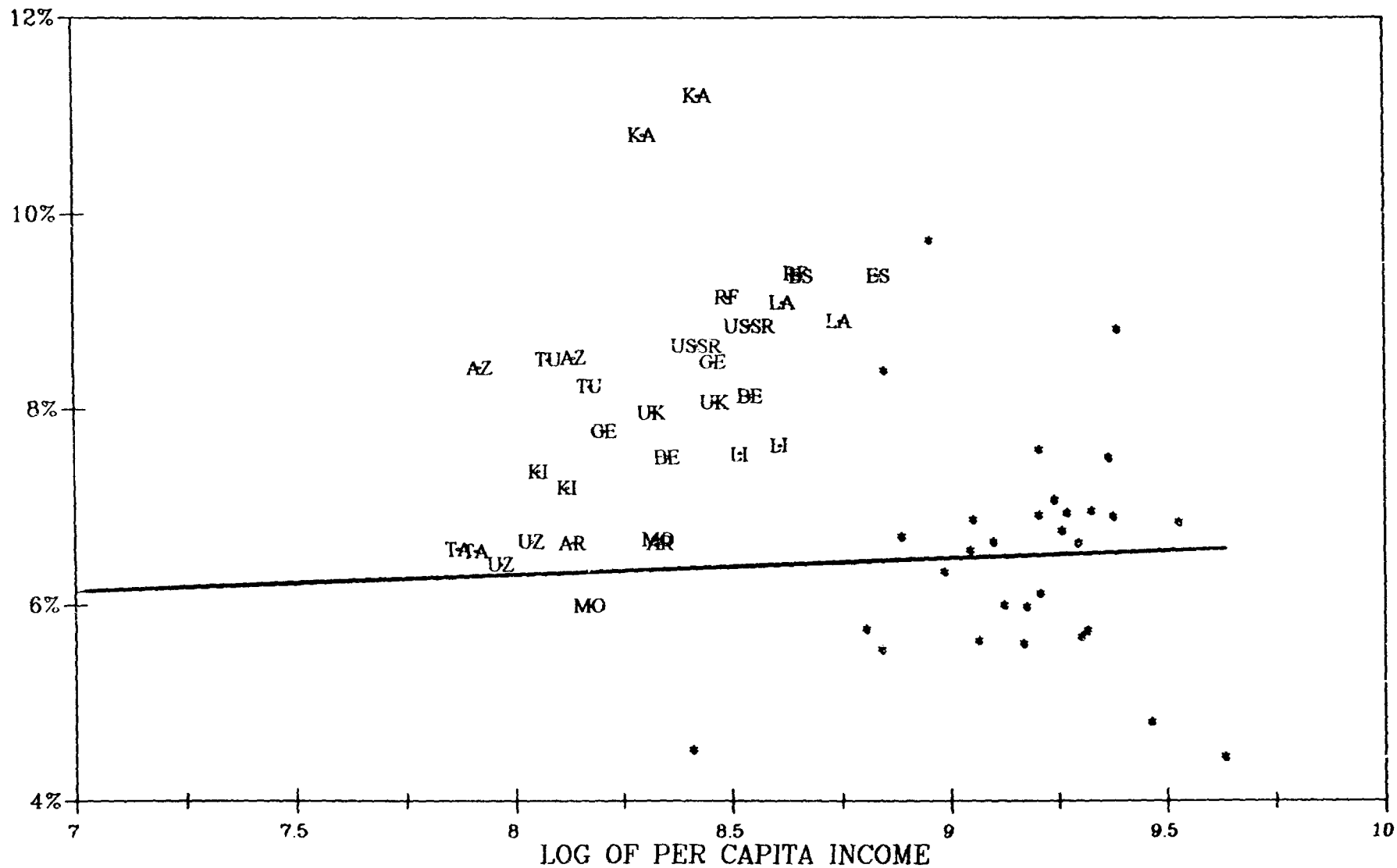


FIGURE 18: SHARE OF TRADE, RESTAURANT, AND HOTEL SERVICES IN EMPLOYMENT:
SOVIET REPUBLICS AND WORLD ECONOMIES

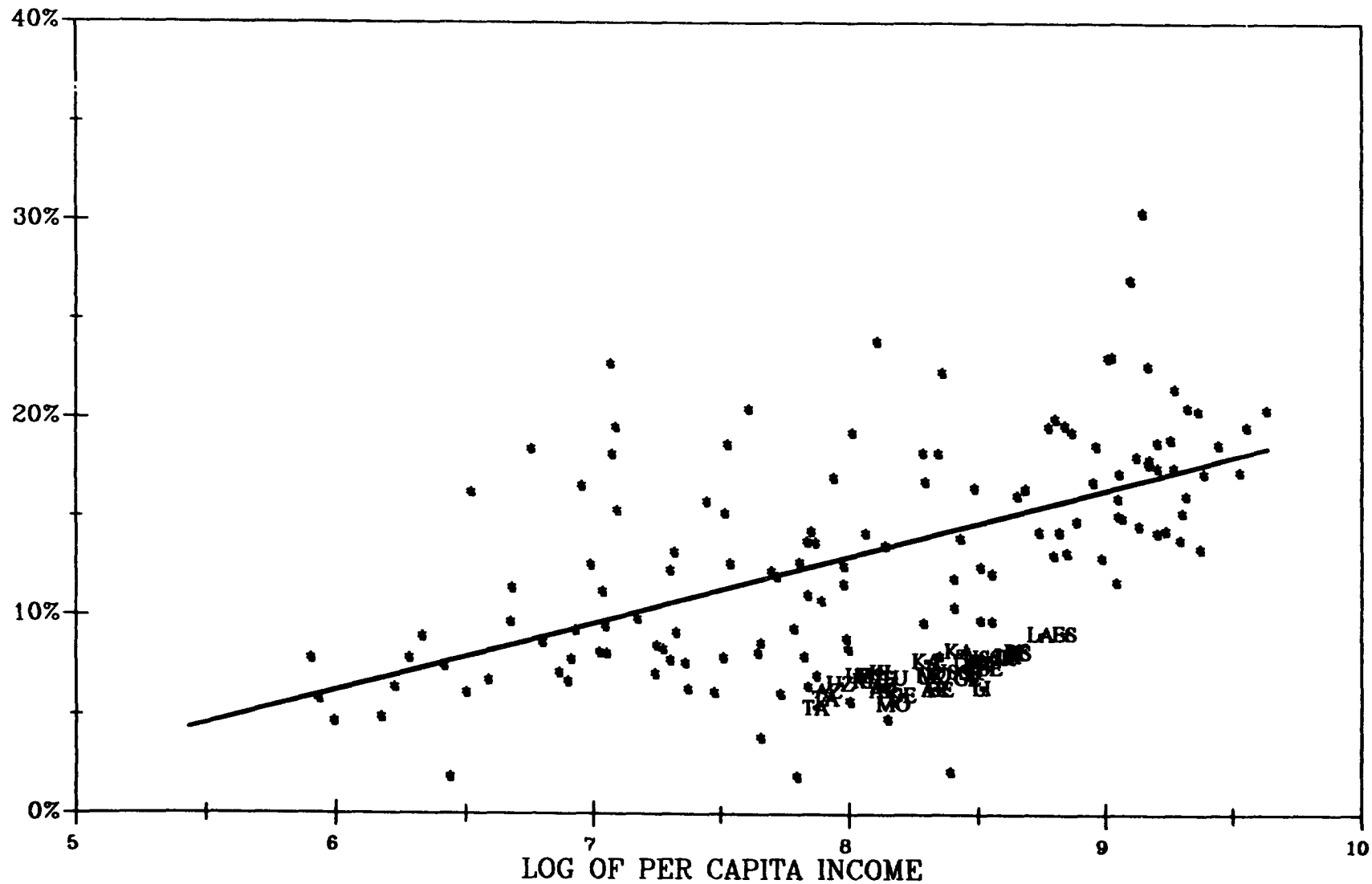


FIGURE 19: SHARE OF TRADE, RESTAURANT, AND HOTEL SERVICES IN EMPLOYMENT:
SOVIET REPUBLICS AND OECD

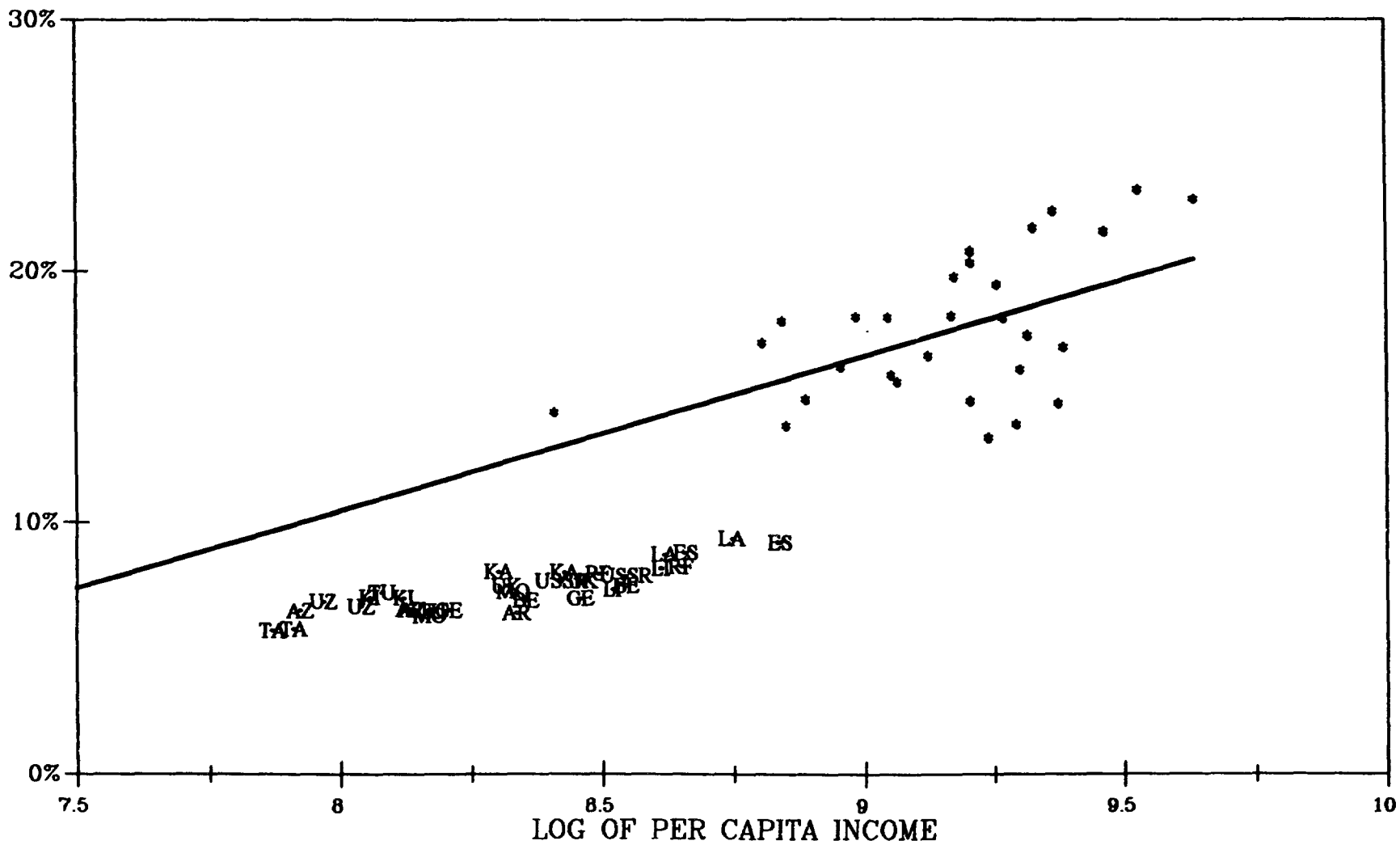


FIGURE 20: SHARE OF WHOLESALE AND RETAIL TRADE IN EMPLOYMENT:
SOVIET REPUBLICS AND OECD

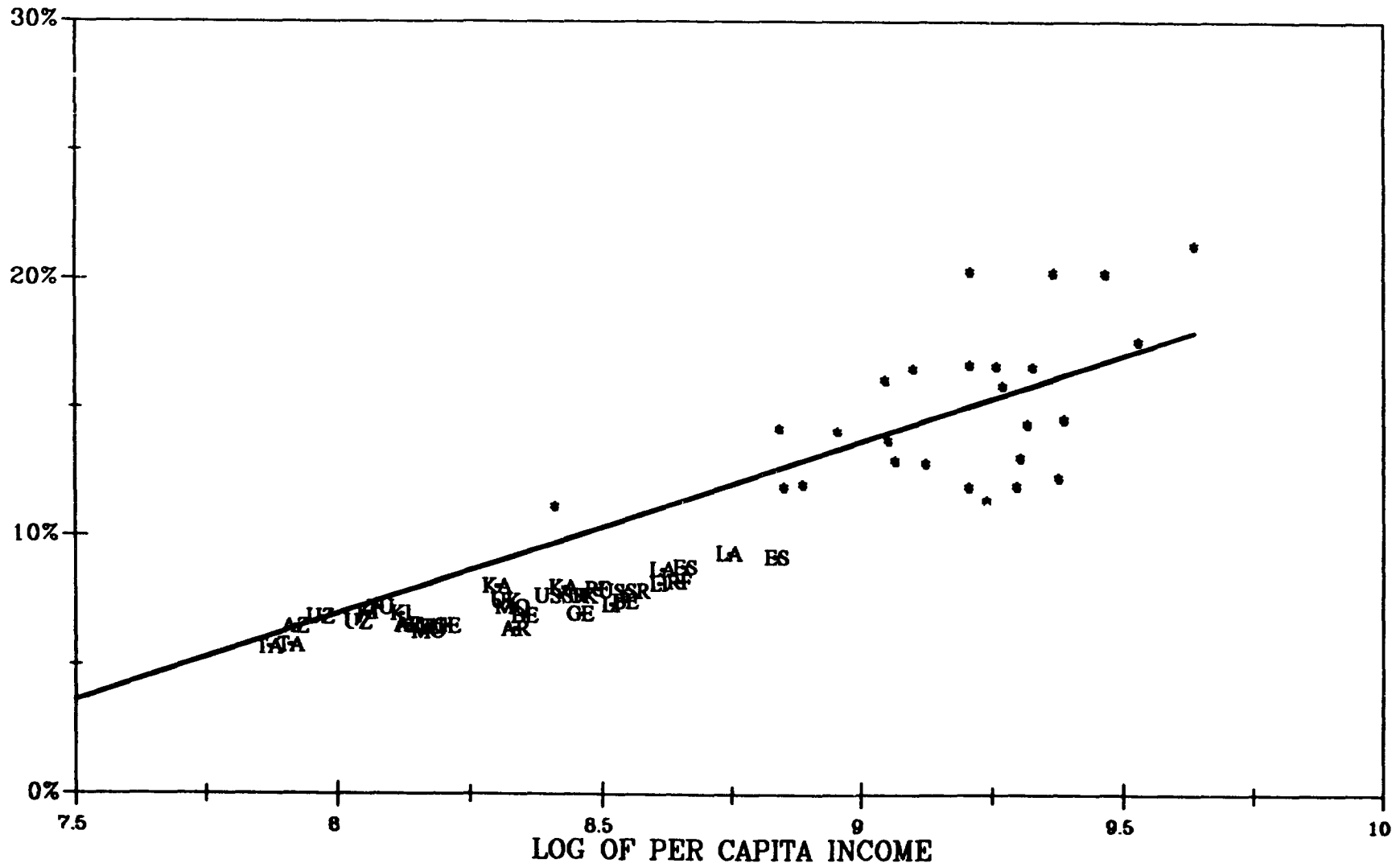


FIGURE 21: SHARE OF BANKING AND INSURANCE SERVICES IN EMPLOYMENT:
SOVIET REPUBLICS AND WORLD ECONOMIES

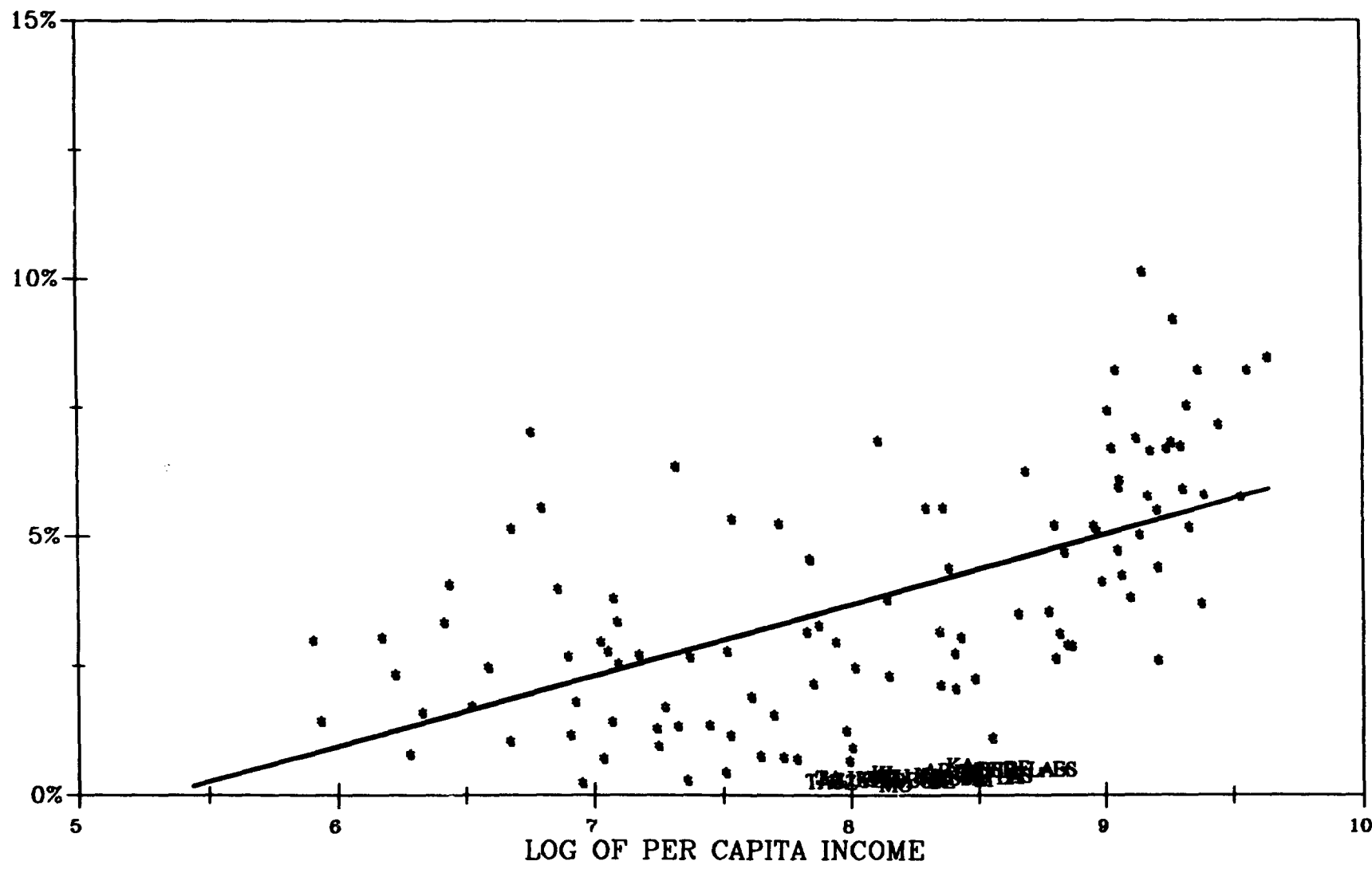


FIGURE 23: SHARE OF HOUSING AND CONSUMER SERVICES IN EMPLOYMENT:
SOVIET REPUBLICS AND OECD

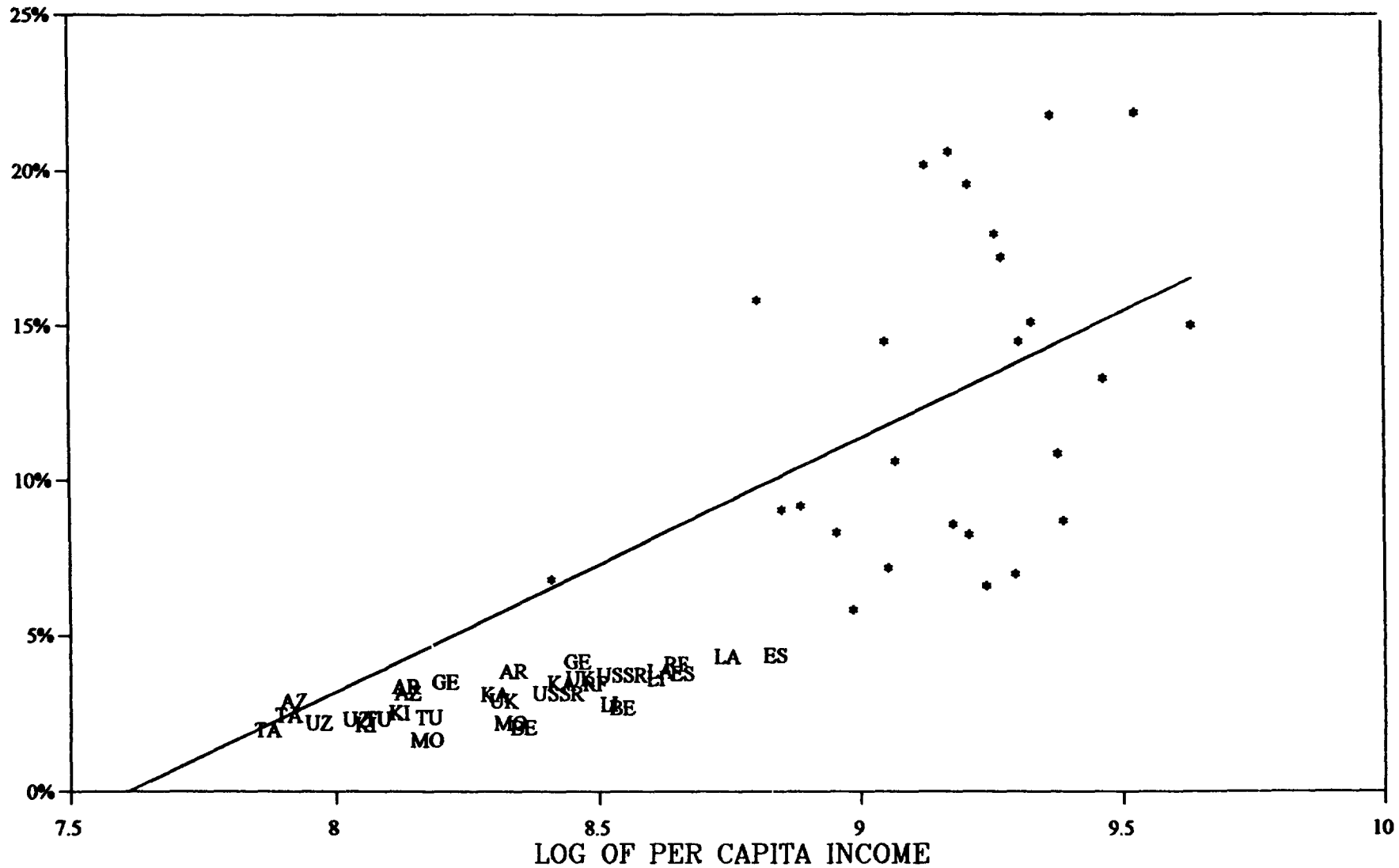


FIGURE 24: SHARE OF GOVERNMENT, HEALTH, EDUCATION AND SCIENTIFIC SERVICES IN EMPLOYMENT: SOVIET REPUBLICS AND OECD

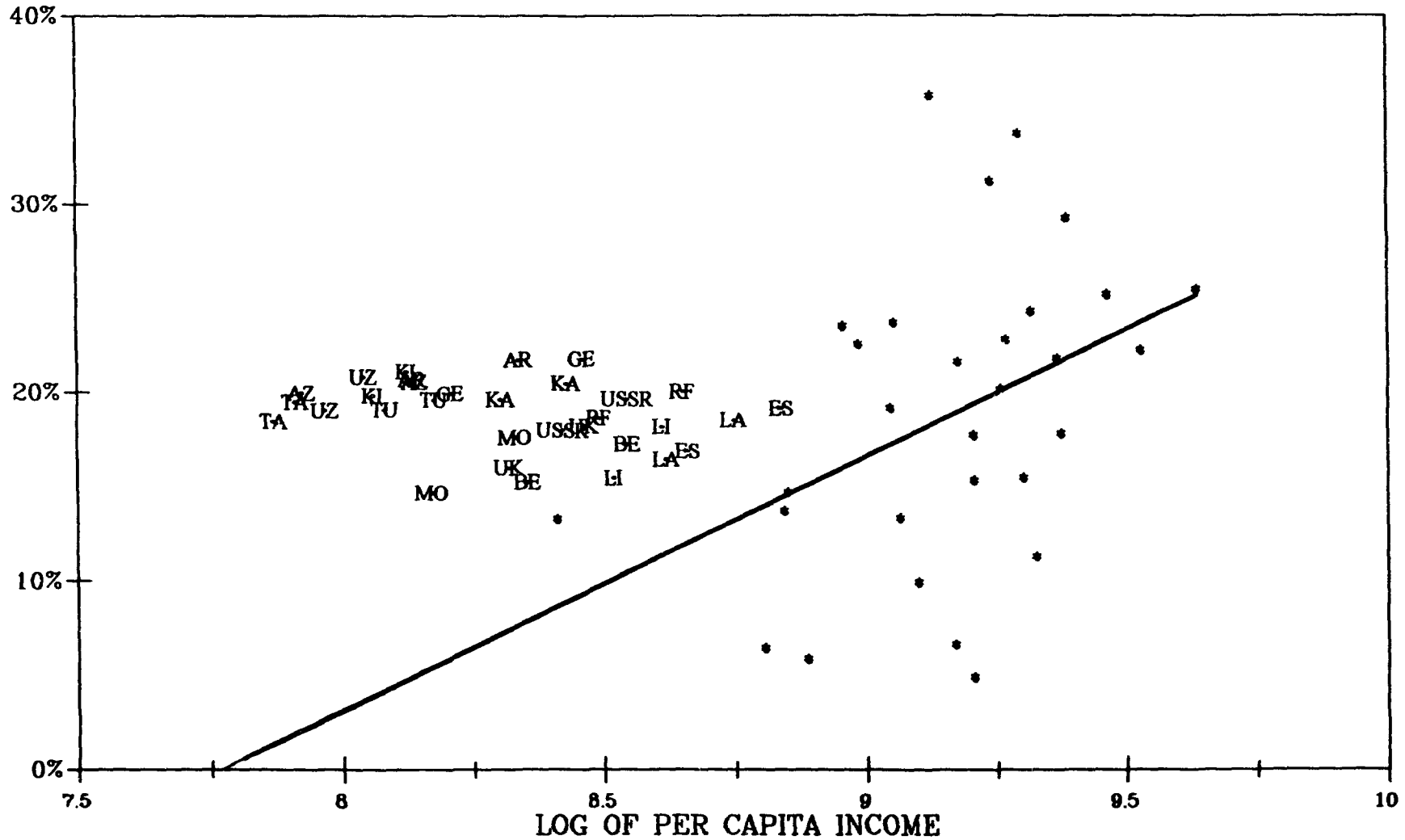
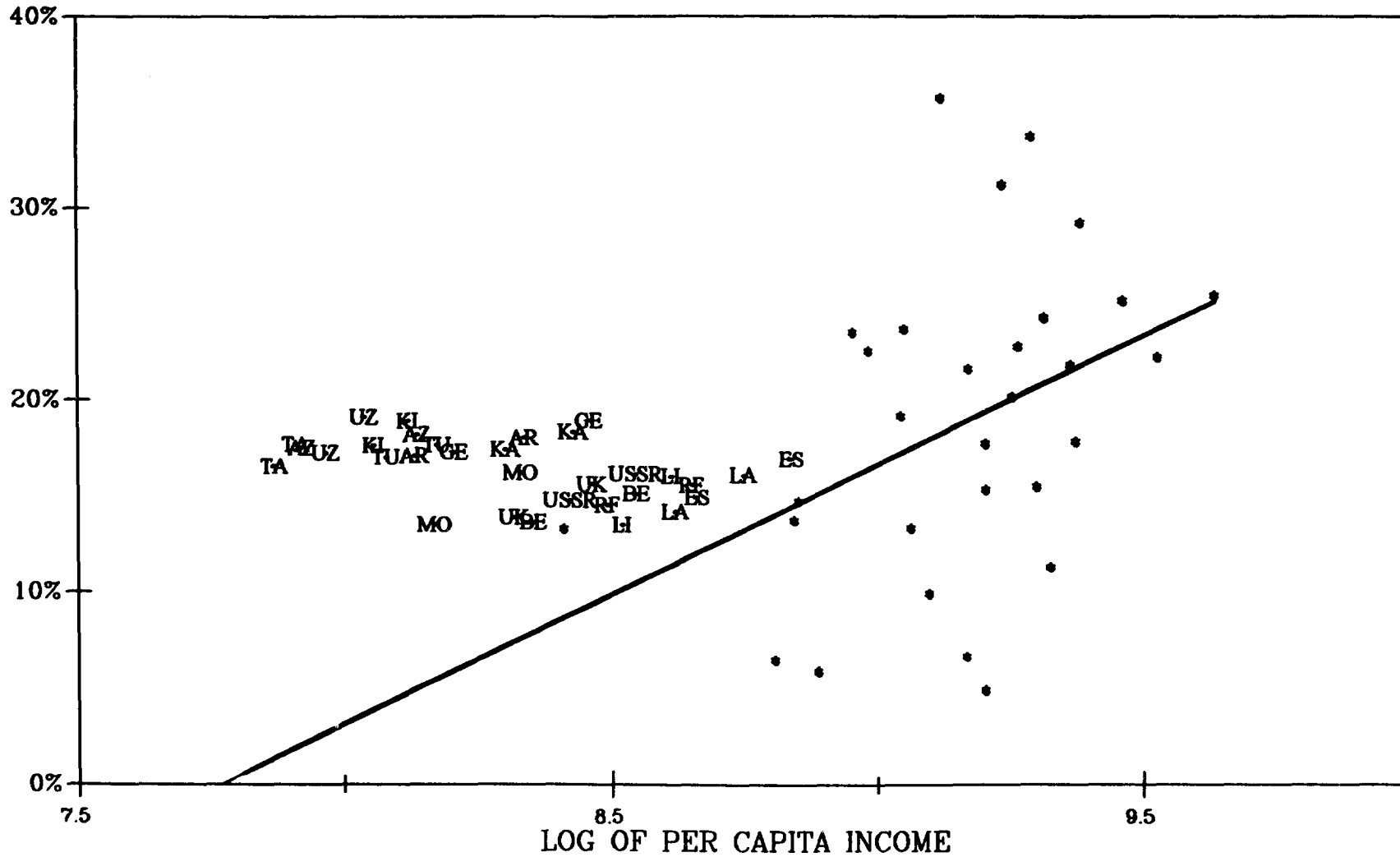


FIGURE 25: SHARE OF GOVERNMENT, HEALTH, AND EDUCATION SERVICES IN EMPLOYMENT:
SOVIET REPUBLICS AND OECD



APPENDIX A

**Statistical Data on the Service Sectors in the USSR, Russia and
other Former Soviet States
1950-1990**

Table A1: GNP by Sector of Origin: The USSR, 1950-1989

percentage	(1)		(2)			(3)	(1)	(2)	
	1970 Prices		1982 Prices			Current Prices	Market		
	Factor Cost		Factor Cost			Factor Cost a/	(Established) Prices		
	1950	1960	1970	1970	1980	1987	1989	1970	1982
GNP (excluding the military)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Agriculture & Forestry	32.94	26.33	21.61	29.14	20.61	20.03	21.36	20.98	15.62
Manufacturing & Construction	26.17	36.27	40.06	37.38	41.70	41.86	49.33	54.18	58.11
Utilities	0.42	0.51	0.61	1.00	1.26	1.51	..	0.51	0.61
Total Services	41.53	37.40	38.23	32.52	36.38	36.56	29.31	24.44	25.66
Infrastructure Services	4.77	7.68	9.79	8.10	10.46	10.66	9.05	8.25	9.33
Transportation	4.13	6.97	8.87	7.46	9.60	9.64	7.74	7.54	8.52
Communication	0.64	0.72	0.92	0.64	0.87	1.02	1.31	0.71	0.81
Business Services	6.46	7.68	8.15	6.42	7.23	7.03	6.96	5.50	5.48
Trade	5.30	6.97	7.44	5.92	6.68	6.49	5.18	4.89	4.67
Banking & Insurance	0.85	0.41	0.41	0.23	0.29	0.27	0.66	0.31	0.41
Information Services	..	..	..	..	..	..	0.20	..	..
Other	0.32	0.31	0.31	0.27	0.26	0.27	0.92	0.31	0.41
Consumer Services	13.77	11.07	9.79	8.20	8.49	8.89	2.72	2.85	3.25
Housing-communal Services	10.59	8.61	7.34	5.63	5.53	5.75	1.80	0.92	0.81
Repair & Personal Care	1.69	1.13	1.22	1.25	1.60	1.87	..	1.12	1.62
Recreation	1.06	1.02	0.82	1.08	1.04	0.96	..	0.51	0.51
Culture	0.42	0.31	0.41	0.25	0.31	0.31	0.92	0.31	0.30
Public Services	9.22	7.99	7.95	8.14	8.39	8.23	10.18	6.31	7.61
Government Administration	7.31	2.97	2.55	1.66	1.81	1.75	0.40	1.53	1.72
Education	5.40	4.00	3.87	4.07	3.98	3.90	4.21	3.05	2.64
Health	2.65	2.36	2.04	2.24	2.14	2.11	2.79	1.63	1.42
Science	1.17	1.64	2.04	1.83	2.27	2.22	3.18	1.63	1.83

a/ Factor prices are derived from market prices by subtracting net taxes and subsidies, charging correct rates for depreciation and return on capital, and adding second economy provision of services.

Sources: (1) Joint Economic Committee, U.S. Congress, *USSR: Measures of Economic Growth and Development, 1950-1980* (1982), Washington, D.C., Joint Committee Print, pp. 41, 59-61.
 (2) Joint Economic Committee, U.S. Congress, *Measures of Soviet Gross National Product in 1982 Prices* (1990), Washington, D.C., Joint Committee Print, pp. 23, 54-57.
 (3) Goskomstat, *Systema Natsional'nykh Schetov SSSR (The System of National Accounts of the USSR)* (1991), Moscow, Goskomstat, pp. 19-20.

Table 2A: Employment by Sector of Origin: The USSR, 1950-1990

A. Including private agriculture

(percentages)

	1950	1960	1970	1980	1985	1990 a/
Total	100.00	100.00	100.00	100.00	100.00	100.00
Agriculture & Forestry	53.91	42.48	32.24	26.37	25.44	18.72
Manufacturing & Construction	23.06	30.34	34.28	35.30	35.18	40.03
Total Services	23.03	27.19	33.48	38.33	39.38	40.48
Infrastructure Services	5.78	7.36	7.86	8.77	8.90	6.55
Transportation & Communication	5.78	7.36	7.86	8.77	8.90	6.55
Business Services	4.73	5.68	7.53	8.64	8.75	10.08
Trade	4.17	4.90	6.36	7.11	7.12	7.52
Banking & Insurance	0.33	0.28	0.33	0.48	0.48	0.50
Other	0.24	0.50	0.84	1.05	1.15	2.05
Consumer Services	2.48	2.19	2.58	3.31	3.48	3.58
Housing-communal & Personal Services	2.48	2.19	2.58	3.31	3.48	3.58
Public Services	10.04	11.97	15.52	17.61	18.25	20.26
Government Administration	2.27	1.31	1.55	1.83	1.89	1.82
Education, Culture and Arts	4.34	5.36	7.15	8.00	8.32	9.82
Health	2.54	3.63	4.28	4.56	4.81	5.56
Science	0.89	1.67	2.53	3.21	3.23	3.06
Unaccounted Sectors	0.00	0.00	0.00	0.00	0.00	0.78

B. Excluding private agriculture

(percentages)

	1950	1960	1970	1980	1985	1990 b/
Total	100.00	100.00	100.00	100.00	100.00	97.95
Agriculture & Forestry	45.86	35.06	25.05	20.32	19.52	18.72
Manufacturing & Construction	27.09	34.25	37.92	38.20	37.97	40.03
Total Services	27.05	30.69	37.03	41.48	42.50	38.42
Infrastructure Services	6.79	8.30	8.69	9.49	9.61	6.55
Transportation & Communication	6.79	8.30	8.69	9.49	9.61	6.55
Business Services	5.56	6.41	8.32	9.35	9.44	10.08
Trade	4.89	5.53	7.03	7.69	7.68	7.52
Banking & Insurance	0.38	0.31	0.36	0.52	0.52	0.50
Other	0.28	0.56	0.93	1.14	1.24	2.05
Consumer Services	2.91	2.47	2.85	3.59	3.75	3.58
Housing-communal & Personal Services	2.91	2.47	2.85	3.59	3.75	3.58
Public Services	11.79	13.51	17.16	19.05	19.70	20.26
Government Administration	2.67	1.47	1.71	1.98	2.04	1.82
Education, Culture and Arts	5.10	6.06	7.91	8.66	8.98	9.82
Health	2.99	4.10	4.74	4.94	5.19	5.56
Science	1.04	1.88	2.80	3.48	3.49	3.06
Unaccounted Sectors	0.00	0.00	0.00	0.00	0.00	0.78

a/ Data for 1990 do not include all private agriculture.

b/ Data for 1990 include some private agriculture.

Sources: Stephen Rapaway and W. Ward Kingkade, *Estimates and Projections of the Labor Force and Civilian Employment in the USSR: 1950 to 2000* (1988), Washington, D.C., Center for International Research, U.S. Bureau of Census, pp. 28-29, 42-43. For 1990, World Bank data (Dmitri Steinberg), 1992.

Table A3: Employment by Sector: The USSR and 15 Republics, 1970-1990

(percentage)

1970	USSR	Estonia	Latvia	Russia	Belarus	Lithuania	Ukraine	Moldova	Armenia	Georgia	Kazakhstan	Azerbaijan	Turkmenistan	Kyrgyzstan	Uzbekistan	Tadjikistan
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Agriculture & Forestry	25.37	18.16	20.53	19.55	36.93	31.47	30.64	50.15	25.05	36.62	26.65	34.50	38.42	34.06	42.17	45.33
Manufacturing & Construction	38.75	44.87	42.99	42.67	33.58	37.92	36.96	23.64	39.04	28.15	32.79	28.56	24.77	30.10	24.64	22.81
Total Services	35.88	36.97	36.49	37.78	29.48	30.61	32.40	26.21	35.91	35.23	40.57	36.94	36.81	35.84	33.18	31.86
Infrastructure Services	8.24	9.15	8.91	8.70	6.94	7.18	7.63	5.44	6.63	7.45	10.43	8.06	8.08	7.27	6.15	6.07
Transportation & Communication	8.24	9.15	8.91	8.70	6.94	7.18	7.63	5.44	6.63	7.45	10.43	8.06	8.08	7.27	6.15	6.07
Business Services	7.64	8.74	8.67	7.97	6.74	6.85	7.34	6.03	6.68	6.41	8.24	6.57	7.40	7.20	6.91	5.78
Trade	7.23	8.20	8.05	7.54	6.33	6.44	6.99	5.58	6.28	6.05	7.77	6.27	7.01	6.77	6.60	5.41
Banking & Insurance	0.34	0.38	0.36	0.37	0.28	0.31	0.29	0.21	0.30	0.30	0.39	0.29	0.30	0.32	0.26	0.27
Information Services	0.07	0.16	0.26	0.06	0.13	0.10	0.06	0.23	0.09	0.06	0.07	0.01	0.09	0.11	0.05	0.09
Consumer Services	2.81	3.32	3.56	3.13	1.69	2.43	2.44	1.27	2.97	3.02	2.73	2.82	2.26	1.94	2.11	1.92
Housing-communal Services	2.81	3.32	3.56	3.13	1.69	2.43	2.44	1.27	2.97	3.02	2.73	2.82	2.26	1.94	2.11	1.92
Public Services	17.19	15.76	15.35	17.98	14.12	14.15	14.99	13.47	19.64	18.35	19.17	19.48	19.07	19.43	18.01	18.09
Government Administration	1.81	2.23	1.89	1.85	1.60	1.77	1.57	1.22	2.08	1.81	2.11	2.20	2.56	2.70	1.77	2.47
Education, Culture, & Arts	7.86	7.17	6.98	7.73	7.28	6.83	7.12	7.83	10.13	8.78	9.77	9.66	9.32	9.56	9.94	9.54
Health	4.64	4.73	4.58	4.69	4.07	4.05	4.55	3.41	4.11	5.43	5.05	5.27	4.88	5.08	4.55	4.09
Science	2.88	1.62	1.90	3.71	1.17	1.51	1.75	1.01	3.31	2.33	2.24	2.35	2.32	2.09	1.75	1.99
1980	USSR	Estonia	Latvia	Russia	Belarus	Lithuania	Ukraine	Moldova	Armenia	Georgia	Kazakhstan	Azerbaijan	Turkmenistan	Kyrgyzstan	Uzbekistan	Tadjikistan
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Agriculture & Forestry	20.25	13.94	16.27	15.02	26.38	22.56	22.92	39.56	21.98	30.57	23.51	33.09	38.39	31.98	38.45	42.16
Manufacturing & Construction	39.54	44.06	42.21	43.16	38.18	40.01	39.78	27.63	39.50	28.10	32.42	27.42	23.50	29.37	24.32	22.66
Total Services	40.20	42.00	41.52	41.82	35.44	37.43	37.30	32.81	38.52	41.33	44.07	39.50	38.11	38.65	37.23	34.49
Infrastructure Services	9.08	9.56	9.42	9.61	8.36	7.98	8.22	6.71	6.74	8.34	11.50	8.85	9.03	7.57	6.93	6.76
Transportation & Communication	9.08	9.56	9.42	9.61	8.36	7.98	8.22	6.71	6.74	8.34	11.50	8.85	9.03	7.57	6.93	6.76
Business Services	8.64	9.97	10.22	8.96	8.23	8.91	8.38	7.78	7.08	7.43	9.11	7.21	7.47	7.92	7.58	6.41
Trade	7.95	9.16	9.14	8.27	7.44	8.01	7.72	7.08	6.37	6.90	8.27	6.57	6.91	7.21	7.06	5.87
Banking & Insurance	0.49	0.51	0.51	0.52	0.51	0.49	0.45	0.35	0.49	0.41	0.58	0.37	0.36	0.44	0.33	0.34
Information Services	0.20	0.29	0.57	0.16	0.29	0.40	0.22	0.34	0.22	0.12	0.26	0.27	0.20	0.27	0.19	0.19
Consumer Services	3.56	4.11	4.25	3.89	2.47	3.38	3.37	1.99	3.67	4.32	3.43	3.05	2.34	2.45	2.31	2.25
Housing-communal Services	3.56	4.11	4.25	3.89	2.47	3.38	3.37	1.99	3.67	4.32	3.43	3.05	2.34	2.45	2.31	2.25
Public Services	18.92	18.37	17.63	19.37	16.38	17.16	17.32	16.34	21.03	21.23	20.04	20.39	19.26	20.71	20.40	19.07
Government Administration	1.80	2.25	1.78	1.82	1.62	1.55	1.64	1.32	1.89	2.09	2.08	1.85	2.54	2.57	1.72	2.26
Education, Culture, & Arts	8.67	8.67	8.17	8.22	8.23	8.24	8.18	9.38	11.17	10.22	10.44	10.97	9.95	10.54	11.47	10.41
Health	4.90	5.16	5.23	4.81	4.47	5.17	4.94	4.36	4.33	6.08	5.28	5.07	4.82	5.19	5.30	4.54
Science	3.56	2.29	2.44	4.52	2.06	2.20	2.55	1.28	3.64	2.91	2.24	2.50	1.96	2.41	1.92	1.86

Table A3 (cont'd)

(percentage)

1985	USSR	Estonia	Latvia	Russia	Belarus	Lithuania	Ukraine	Moldova	Armenia	Georgia	Kazakhstan	Azerbaijan	Turkmenistan	Kyrgyzstan	Uzbekistan	Tadzhikistan
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Agriculture & Forestry	19.45	13.30	15.52	14.26	23.62	19.72	21.19	36.41	20.26	27.88	23.29	33.06	40.42	32.78	37.93	43.10
Manufacturing & Construction	39.44	43.54	42.36	42.92	39.84	41.42	40.29	28.81	40.21	30.21	32.42	27.48	22.51	28.69	24.42	22.39
Total Services	41.10	43.17	42.13	42.82	36.54	38.86	38.52	34.78	39.56	41.91	44.30	39.45	37.06	38.54	37.65	34.52
Infrastructure Services	9.20	9.56	9.17	9.79	8.35	8.00	8.33	6.97	6.79	8.68	11.60	8.83	8.38	7.50	7.02	6.76
Transportation & Communication	9.20	9.56	9.17	9.79	8.33	8.00	8.33	6.97	6.79	8.68	11.60	8.83	8.38	7.50	7.02	6.76
Business Services	8.63	10.04	10.42	9.00	8.34	9.17	8.40	8.02	7.21	7.52	8.93	7.24	6.97	7.51	7.20	6.24
Trade	7.93	9.25	9.34	8.30	7.52	8.26	7.71	7.31	6.47	6.98	8.07	6.58	6.46	6.88	6.70	5.74
Banking & Insurance	0.50	0.52	0.52	0.53	0.54	0.51	0.46	0.38	0.48	0.42	0.58	0.38	0.33	0.41	0.33	0.32
Information Services	0.20	0.27	0.56	0.16	0.27	0.40	0.22	0.32	0.26	0.12	0.28	0.28	0.18	0.22	0.17	0.18
Consumer Services	3.72	4.32	4.17	4.08	2.73	3.64	3.64	2.14	3.80	4.14	3.45	3.13	2.38	2.56	2.26	2.40
Housing-communal Services	3.77	4.32	4.17	4.08	2.73	3.64	3.64	2.14	3.80	4.14	3.45	3.13	2.38	2.56	2.26	2.40
Public Services	19.57	19.25	18.37	19.96	17.14	18.05	18.15	17.65	21.76	21.56	20.32	20.26	19.33	20.97	21.16	19.11
Government Administration	1.86	2.31	1.93	1.88	1.69	1.55	1.72	1.44	1.77	2.12	2.09	1.79	2.49	2.69	1.69	2.30
Education, Culture, & Arts	8.99	8.96	8.56	8.51	8.61	8.81	8.49	9.85	11.10	10.39	10.56	10.83	10.08	10.78	11.97	10.33
Health	5.14	5.77	5.40	5.00	4.67	5.56	5.26	4.94	5.17	6.26	5.50	5.36	4.76	5.28	5.69	4.71
Science	3.57	2.21	2.47	4.56	2.18	2.12	2.68	1.42	3.72	2.80	2.16	2.29	2.00	2.22	1.82	1.77
1990	USSR	Estonia	Latvia	Russia	Belarus	Lithuania	Ukraine	Moldova	Armenia	Georgia	Kazakhstan	Azerbaijan	Turkmenistan	Kyrgyzstan	Uzbekistan	Tadzhikistan
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Agriculture & Forestry	18.72	12.75	15.93	13.38	19.56	18.18	19.39	32.73	17.74	25.57	22.83	32.22	41.94	32.72	39.29	42.97
Manufacturing & Construction	40.65	43.95	41.15	44.24	43.19	43.58	41.89	31.42	43.34	33.09	34.21	27.52	22.45	29.33	25.71	23.41
Total Services	40.64	43.34	42.93	42.38	37.25	38.24	38.73	35.85	38.92	41.33	42.97	40.26	35.62	37.94	35.00	33.62
Infrastructure Services	7.40	8.59	7.33	7.87	7.09	5.72	7.08	5.40	5.21	7.13	9.31	7.67	5.97	5.38	5.06	4.85
Transportation & Communication	7.40	8.59	7.33	7.87	7.09	5.72	7.08	5.40	5.21	7.13	9.31	7.67	5.97	5.38	5.06	4.85
Business Services	8.29	9.67	10.97	8.70	8.31	9.39	8.23	7.88	6.93	7.06	8.21	6.91	6.16	7.25	6.24	6.07
Trade	7.52	8.74	9.12	7.92	7.42	8.29	7.48	7.14	6.18	6.48	7.41	6.28	5.67	6.59	5.78	5.55
Banking & Insurance	0.51	0.50	0.51	0.54	0.56	0.65	0.51	0.45	0.48	0.43	0.52	0.38	0.32	0.40	0.29	0.31
Information Services	0.26	0.43	1.34	0.25	0.34	0.44	0.24	0.29	0.27	0.15	0.28	0.25	0.16	0.26	0.17	0.21
Consumer Services	3.98	4.45	4.63	4.36	2.94	3.65	3.93	2.71	4.05	4.76	3.86	3.58	2.48	2.59	2.44	2.62
Housing-communal Services	3.98	4.45	4.63	4.36	2.94	3.65	3.93	2.71	4.05	4.76	3.86	3.58	2.48	2.59	2.44	2.62
Public Services	20.96	20.64	19.99	21.44	18.90	19.48	19.49	19.86	22.73	22.39	21.59	22.10	21.01	22.72	21.26	20.08
Government Administration	1.82	2.19	1.83	1.86	1.68	1.50	1.71	1.52	1.71	1.87	2.05	1.83	2.19	2.43	1.50	2.05
Education, Culture, & Arts	10.12	10.03	9.77	9.70	9.87	9.97	9.34	11.22	12.01	11.22	11.72	12.11	11.38	12.33	12.57	11.21
Health	5.75	6.16	5.75	5.63	5.21	5.95	5.94	5.53	5.77	6.65	6.03	6.00	5.60	5.98	5.89	5.35
Science	3.27	2.26	2.64	4.25	2.15	2.07	2.50	1.58	3.26	2.65	1.79	2.08	1.83	1.98	1.30	1.47

Source: Gosstatizdat data, Moscow, 1992.

Table A4: End Use as Percentage of GNP, at Market (Established) Prices and Factor Cost: The USSR, 1970-1990

(percentage)	Market Prices (1)	Factor Cost (1)	Market Prices (2)	Factor Cost (2)	Market Prices (3)	Market Prices (4)
	1970	1970	1982	1982	1987	1990
Total GNP a/	100.00	100.00	100.00	100.00	100.00	100.00
Household Consumption	55.10	54.20	53.40	55.30	53.12	54.95
Consumer Goods	43.40	34.70	41.80	35.20	40.25	42.65
Consumer Services	11.60	19.50	11.60	20.00	12.86	12.30
Housing	0.90	7.00	0.90	5.60	1.14	2.73
Utilities	0.90	1.00	0.90	1.70	0.99	..
Transportation	1.40	1.70	1.50	1.60	1.31	1.21
Communication	0.30	0.50	0.40	0.40	0.38	0.64
Repair & Personal Care	1.40	1.20	1.90	2.00	1.79	..
Recreation	3.70	1.00	0.60	1.10	0.90	..
Education	3.80	4.50	3.40	4.80	3.84	3.61
Health	2.20	2.60	2.00	2.80	2.28	3.32
Culture	..	..	..	..	0.36	0.50
Banking & Insurance	..	..	..	..	..	..
Miscellaneous Services	..	..	..	..	0.24	..
Public Consumption	16.40	17.60	18.60	14.30	15.12	16.95
Government Administration	2.40	2.80	2.70	2.90	2.45	2.19
Research & Development b/	2.70	3.10	3.40	11.40	2.86	1.33
Other	11.40	11.60	8.10	..	9.80	13.43

a/ For 1990 total GDP is used.

b/ Research and Development at factor cost for 1982 includes Other.

Sources: (1) Joint Economic Committee, U.S. Congress, *USSR: Measures of Economic Growth and Development, 1950-1980* (1982), Washington, D.C., Joint Committee Print, p. 41.

(2) Joint Economic Committee, U.S. Congress, *Measures of Soviet Gross National Product in 1982 Prices* (1990), Washington, D.C., Joint Committee Print, p. 26.

(3) Albina Tretyakova, *USSR: Gross National Product Accounts by Republic, 1987* (1992), Washington, D.C., Center for International Research, U.S. Bureau of Census, p. 169.

(4) World Bank data (Dmitri Steinberg), 1992.

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