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SAVING-INVESTMENT ASSOCIATIONS AND CAPITAL MOBILITY ON THE EVIDENCE FROM JAPANESE REGIONAL DATA

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ABSTRACT

We will examine the size of the Feldstein and Horioka (1980) "saving-retention coefficient" in a setting of near perfect capital mobility, Japanese regions. We first find that on total regional saving and investment rate data, inclusive of regional government saving and investment, the estimate of the coefficient is negative. This negative relationship in the total rates across Japanese regions appears to arise from the strong negative association in the government saving and investment rates.

Second, on private regional investment and saving rate data, the "saving-retention coefficient" is insignificantly different from zero. This is evidence consistent with the Feldstein and Horioka hypothesis that in a financially integrated economy, the coefficient will be close to zero.

Finally, we find that countries and regions differ in their saving and investment rate responses to demographics. This different response to demographics may be partly behind the divergence in the "saving-retention coefficient" reported in this paper and those found in cross-country regressions.

Saving-Investment Associations and Capital Mobility On the Evidence from Japanese Regional Data

Robert Dekle[1]

1. Introduction.

Feldstein and Horioka (1980) estimated the following equation on a sample of sixteen OECD countries, averaging annual data for sub-periods between 1960 and 1974.

$$\frac{I}{Y}=a+b*\frac{S}{Y}+u. \qquad (1)$$

Data on gross total investment and saving rates averaged over the entire 1960 to 1974 period led to a significant estimate of b, the "saving retention coefficient" of 0.887. The authors interpret this high estimate of b as indicative of low international capital mobility.

Many papers were since written objecting to the Feldstein and Horioka interpretation of the high "saving retention coefficient." These papers have tried to explain the high b, not by capital immobility, but by identifying economic forces that

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may raise both the saving and investment rates.[2]

In this paper, we will examine the magnitude of the "saving retention coefficient" in a setting of known near perfect capital mobility, Japanese regions.[3] If the Feldstein-Horioka interpretation of the international "saving retention coefficient" is correct, the regression coefficient of the regional investment rate on the regional saving rate should be close to zero.

The main objective of this paper is to provide a set of stylized facts for the relationships between regional private and public saving and investment for Japan. The following are our findings.

First, on <u>total</u> regional saving and investment rate data,

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[2]Some of the forces mentioned are demographics (Obstfeld, 1986), government policies (Summers, 1988; Artis and Bayoumi, 1989), and high and persistent differences in international capital-output ratios (Obstfeld, 1994). For a literature review, see Tesar (1991) and Obstfeld (1986;1994).

[3]The estimation of the relationship between saving and investment on regional data is not new. With 1957 data on U.S. States, Sinn (1992) finds that the total saving and investment rates are uncorrelated. Using the regional data of Germany, the United Kingdom, and Canada, Thomas (1991) has results similar to this study: within a country, the regional private saving and investment rates are uncorrelated, but the regional total saving and total investment rates are negatively correlated. With data on 11 British regions, Bayoumi and Rose (1993) find that both the total saving and investment rates and the private saving and investment rates have zero cross-section correlations.

The Japanese regional data used in this paper appear somewhat superior to those analyzed in previous work. Given the smaller number of regions in Germany, the United Kingdom, and Canada compared to Japan, the earlier work did not have as many observations. The U.S. data is only for one year (1957), and cyclical factors may affect the saving-investment correlations. As Sinn notes, a cross-section snapshot may catch some countries in a recession, with low saving and investment, and others in a boom.

inclusive of regional government saving and investment, the estimate of b is negative. This negative relationship in the total rates across Japanese regions appears to arise from the strong negative association in the government saving and investment rates.[4]

Second, on private regional investment and saving rate data, b is insignificantly different from zero. This is evidence consistent with the Feldstein and Horioka (1980) hypothesis that in a financially integrated economy, b would be close to zero.[5]

Third, we show that as the proportion of the elderly to the working age population (the elderly ratio) rises, both the regional private investment and saving rates are unchanged, which is contrary to what is observed in cross-national data (Horioka, 1991). This difference between regions and countries in the saving and investment rate responses to demographics may be partly behind the divergence in b reported in this paper and those commonly found in cross-country regressions.

Although our overall findings are somewhat supportive of the Feldstein and Horioka interpretation, they are also consistent

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[4]These results lend some support to the hypothesis that government fiscal policy can affect the level of the current account surplus, since if private agents endogenize government choices, changes in the government saving and investment rates should not change the total saving and investment rates (Summers, 1988; Artis and Bayoumi, 1989).

Given, however, that both regional government saving and investment are endogenous, the conclusion that government fiscal policy can affect the current account is still tentative.

[5]In contrast to our results for regions, Feldstein and Horioka found that across countries, the coefficient estimate on private saving was 1.172, with a t-statistic of 9.23.

with the view that the high cross-national estimate of b is spurious, caused by some factor affecting both the national saving and investment rates, such as demographics.

This paper presents one of the first estimates of the "saving retention coefficient" using the Japanese regional accounts.[6] The Japanese regional accounts appear to be far superior to those of other nations. First, with the data, we can in principle form a panel of 47 prefectures for 14 years. Most of our results are from data averaged over relatively long time

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[6]More recently, Iwamoto and van Wincoop (1994) use the Japanese regional accounts to estimate correlations between public and private saving and investment. Their calculation of regional government saving differs from our calculation in two ways.

First, the authors do not include in prefectural tax receipts, the taxes paid by the prefectural residents to the national government. Only the prefectural and local level (city, villages, and towns) taxes are included. We include in regional tax revenues, in addition to the prefectural and local taxes, taxes paid by the prefectural residents to the central government.

We view the prefecture as a "country," and the central government as a "supra-national" government like the European Commission or the World Bank. The prefecture collects the national taxes, and pays an "assessment" to the national government equal to the level of the national taxes, and in return, receives transfers or "foreign aid" from the central government. The transfers are used to fund regional government consumption and investment.

Second, Iwamoto and van Wincoop include central government transfers as part of regional government revenues. We exclude the transfers. Consequently, according to our definition of regional government saving, poor regions run deficits; total tax collections are low and government spending is high. By the definition of Iwamoto and van Wincoop, poor regions tend to run surpluses, prefectural tax collections plus central government transfers are high.

Unlike in our paper, Iwamoto and van Wincoop find that the total saving and investment rates are slightly positively correlated. Because of their inclusion of central government transfers in regional government revenues, poor regions have high government saving and investment. The authors also find that the private saving and investment rates are slightly positively correlated, but they do not calculate significance statistics.

periods, where the effects of short-run shocks are smoothed out.

Second, as described in the Appendix, the Japanese regional accounts are comparable to the national income accounts of entire countries. For the regional data of other nations, various components of the national income identity are missing.[7]

The next Section depicts the scatter plots and coefficient estimates of b using Japanese regional saving and investment rate data. Section 3 asks whether differences in the elderly ratio can explain the co-movements in regional saving and investment. Section 4 concludes, and the Japanese regional data are described in the Appendix.

2. The Saving Retention Coefficient in Japanese Regional Data.

All of the scatter plots and coefficient estimates below both include and exclude the high gross income prefectures in the Kanto and Kansai areas.[8] Since many residents in prefectures neighboring Tokyo and Osaka consume in Tokyo and Osaka, the consumption by Tokyo and Osaka residents may be overstated in the data.

Figures 1(a) and 1(b) depict scatter plots of the total

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[7]For example, for consumption in the American States and for the regions of Great Britain, only retail sales data are available. In Japanese regional consumption data, in addition to retail sales, the other included items are implicit rent, the health insurance portion of medical expenditures, and salaries in kind.

[8]Niigata and Iwate are dropped since some components of GNP could not be calculated, which leaves our working sample with 45 observations. The Kanto prefectures are Saitama, Chiba, Tokyo, and Kanagawa. The Kansai prefectures are Kyoto, Shiga, Osaka, Hyogo, and Nara.

gross prefectural investment and saving rates.[9] There appears to be a negative relationship.

Table 1 shows estimates of b using various time-averaged sub-samples of the total prefectural investment and saving rates.[10] For all sub-samples, there is again a negative association.

The negative estimate of b results from the very negative correlation between the regional government saving and government investment rates (Figure 2).[11] Regional public finance is tightly controlled by the central government (in Tokyo), and large transfers occur between the central and regional budget

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[9]All of the scatter-plots depict data time-averaged between 1975 and 1988.

We examine the gross, rather than the net saving rates since for some prefectures, depreciation rates are missing. The definitions of total, government, and private saving and investment are given in the Appendix.

[10]The estimates are performed on prefectural data scaled to add up to national values. On unscaled total investment and saving rate data (time-averaged between 1975-1988), b is -0.28 with a t-statistic of -4.10.

[11]We know that cov[s,i]=cov[sg+sp,ig+ip]=cov[sg,ig]+ cov[sg,ip]+cov[sp,ig]+cov[sp,ip], where sg is the government saving rate, sp is the private saving rate, ig is the government investment rate, and ip is the private investment rate. For the 45 prefectures on data averaged between 1975 and 1988, the covariance between total investment and saving is -0.00188 and is decomposed, in the above ordering as (-0.0012513)+(-0.00017395)+ (-0.00068344)+(0.000221).

The covariance between the government investment and saving rates is negative and is much larger in absolute value than the other covariances, although we do not know if these covariances are statistically significant.

authorities (Ishihara, 1986).[12] In prefectures with low per capita incomes, tax receipts are low and welfare transfers, such as unemployment benefits, are high, raising the deficit (Yonehara, 1986). In poor prefectures, the public investment rate is high, often in excess of 33 percent of total prefectural investment.

We next examine the private regional gross investment and saving rates. From the scatter plots, we detect no apparent association between the two rates (Figures 3(a) and 3(b)).

Estimates of the saving retention coefficient using private investment and saving rate data are shown in Table 2(a).[13] For all sub-samples, b is insignificantly different from zero.

Obstfeld (1994) has suggested that the high dispersion of saving rates in a plot like Figure 3(a) may indicate measurement error, which will bias the estimate of b towards zero. The standard solution for measurement error is the method of instrumental variables (Greene, 1993; p. 284).

Table 2(b) presents instrumental variables estimates of b. As an instrument for the private saving rate, following Feldstein and Horioka (1980), we use the elderly ratio, the proportion of

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[12]In Japan, the central government social policy since 1970 has been to try to equalize regional incomes (Okuno and Futagami, 1990). Of all the taxes received by the central government, 32 percent are allocated to the regional governments. In 1988, excluding debt issue, two-thirds of Hokkaido's (a relatively poor prefecture) government revenues were from the central government.

[13]On data unscaled except for net social security benefits, b for the private saving and investment rates (time-averaged between 1975-1988) is 0.080 with a t-statistic of 1.50.

the population over the age of 65 to the working age population (15-64).[14] As shown in the bottom panel, the elderly ratio appears to be a poor instrument. Although the instrumental variables estimates of b are again insignificantly different from 0, the possibility of measurement error suggests that we should interpret the results using the private rates with caution.[15]

3. The Elderly Ratio and Regional Saving and Investment.

While some authors have interpreted the high estimate of b in cross-country data as evidence that much of national saving is retained at home, others have tried to explain the high b by identifying economic forces that may raise both the national saving and investment rates. For example, Tesar (1991) has shown that countries with a high elderly ratio have low total saving and investment rates, which leads to a positive correlation in the two rates even when capital is highly mobile.[16] In this Section, we will see if countries and regions differ in their saving and investment rate responses to the elderly ratio.

Figures 4(a) and 4(b) depict the relationships between the elderly ratio and the prefectural total saving and investment rates. As the elderly ratio increases, the regional total saving

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[14]The elderly ratio may be more appropriate as an additional regressor in the investment-saving rate regression. A high elderly ratio lowers the labor supply, and the investment rate does not need to be high to maintain the steady-state capital-output ratio.

[15]Unfortunately it was difficult to find other prefectural instrumental variables correlated with the private saving rate, but uncorrelated with the private investment rate.

[16]One implication of the aggregate life-cycle hypothesis is that a high proportion of the elderly lowers the total saving rate.

rate falls, but the total investment rate rises.[17] The latter finding contradicts what is found in cross-country data, but can be explained by noting that prefectures with a high proportion of the elderly tend to be poor, with high public investment rates.[18]

Figures 5(a) and 5(b) show that the elderly ratio and the private saving and investment rates are unrelated.[19] By dropping Tokyo, the outlier with the 35 percent rate, the private investment rate becomes positively associated with the elderly ratio.[20] These findings are again contrary to what is found in cross-country data, where both rates are negatively correlated with the elderly ratio (Horioka, 1991). For the private saving rate, this lack of explanatory power in the elderly ratio may be

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[17]A regression of the regional total saving rate on a constant and the elderly ratio resulted in a coefficient estimate on the elderly ratio of -0.30 with a t-statistic of -1.66. With the regional total investment rate as the dependent variable, the coefficient on the elderly ratio was 0.32 with a t-statistic of 2.42.

[18]Because of the lack of job opportunities, the young have moved to the more affluent prefectures. Net outmigration tend to be high in the poor prefectures in the North and in the South. Between 1970 and 1992, the only rich prefecture suffering from net outmigration was Tokyo. Most of the Tokyo outmigrants moved to the suburbs.

[19]A regression of the private saving rate on a constant and the elderly ratio led to a coefficient estimate on the elderly ratio of -0.11 with a t-statistic of -0.86. When the private investment rate was regressed on the elderly ratio, the coefficient was -0.0002 with a t-statistic of -0.089.

[20]Dropping Tokyo, the coefficient on the elderly ratio becomes 0.770 with a t-statistic of 2.23.

related to the failure of the life-cycle hypothesis for Japan.[21] Using household level data, Dekle (1990) has shown that the elderly in Japan tend not to dissave.

4. Conclusion.

In this paper, we showed that the association between the Japanese regional total saving and investment rates is negative and the relationship between the private rates is statistically insignificant. One interpretation of the overall findings is that capital mobility is higher within countries than among them.

This interpretation, however, is somewhat tentative. First, although the Japanese regional data appear to be better than that in other countries, as mentioned in Section 2 and in the Appendix, substantial measurement problems exist. Second, demographics influence the regional saving and investment rates and the national rates differently. The possibility remains that international capital mobility is actually quite high, and that the high b estimate found in many cross-country studies is spurious.

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[21]Also, the high rate of inter-regional migration makes the elderly ratio endogenous, possibly resulting in simultaneity biases in our scatter plots and coefficient estimates.

Appendix: The Japanese Regional Data.

The main data set is the 1992 version of the Annual Report on the Prefectural Accounts (PA), compiled by the Economic Research Institute of the Japanese Economic Planning Agency (EPA), and is a 14 year panel (1975-1988) of the income accounts of Japan's 47 prefectures.

In compiling the PA, the EPA asked each prefecture to construct income accounts in accordance with the rules of the United Nations System of National Accounts (SNA). All items in the National Income Identity, C+I(p)+I(g)+G+X-M, exist for most of the prefectures.[22] For estimation, all items in the National Income Identity are scaled so that they will add up to the national aggregates as reported in the Japanese national income accounts.[23]

Total saving is prefectural Gross National Product (GNP) minus consumption minus government spending.[24] Private saving

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[22]C is private consumption, I(p) is private investment, I(g) is government investment, G is current government spending, X-M is the current account surplus. For two prefectures, Niigata and Iwate, service income and central government and private transfers from outside of the prefecture are missing and GNP cannot be calculated. Niigata and Iwate are dropped from our working sample.

[23]Since the GNPs of Niigata and Iwate are missing, the GNPs of the remaining 45 prefectures are scaled so that they will add up to 98 percent of the national GNP.

As shown in footnotes 9 and 12 in the text, the basic regressions are re-run using the unscaled figures for GNP and its components, and the results are unchanged.

[24]As an income measure, prefectural GNP is preferable to prefectural GDP, since the former includes the net factor income and transfers received from outside the prefecture.

is defined as:

$$GNP-C-LTAX-NTAX+NSS+WELF,$$

where LTAX is the tax paid by the private sector (households and firms) to the regional government (the sum of the taxes paid to the prefectural government, and the combination of city, town, village, and ward governments), NTAX is the tax paid to the central government (in Tokyo), NSS are net social security benefits (the difference between social security benefits and taxes), and WELF are social assistance grants paid by the regional and central governments to the private sector. Government saving is defined as total saving minus private saving.

Since the PA do not include measures for LTAX, NTAX, and WELF, these items are taken from the Asahi Newspaper's Minryoku data base (various years), a convenient compilation of official government statistics at the prefectural and local levels. For example, for LTAX, Minryoku reports the values in the Ministry of Home Affairs's Annual Statistical Report on Local Government Finance (ALG).[25] For the NTAX, the original statistics are from the National Tax Agency's National Tax Totals.

Total social security taxes are calculated by doubling the employer's contribution as reported in the PA. Under the current social security system for employees (System 1), the employer and the employee each pays half of the contributions. There is

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[25]I checked the ALG and the values reported in the Minryoku are identical.

another social security scheme for the self-employed (System 2), and we assume that contributions to this system are proportional to the contributions to System 1. The prefectural contributions to System 1 are then scaled so that they will sum to the national income accounts totals for the social security taxes.[26]

The Japan Statistical Yearbook (various years) publishes the social security benefits received by the self-employed in each prefecture. We assume that benefits at the prefectural level for employees are proportional to that for the self-employed and scale System 2 benefits so that they will sum to the value of the benefits in the national accounts.[27]

Table A1 depicts the unscaled (PI), Minryoku, and Social Security data for 1988 and compares the regional totals to the national income accounts aggregates. The data are in billions of yen. Although scaled, the social security benefits and taxes do not sum to the national aggregates because of the exclusion of Niigata and Iwate. Net social security benefits tend to be positive for the poor, "high elderly ratio," prefectures in the North and in the South. The underestimation of GNP appears slight compared to the underestimation of its components. The components underestimation relative to GNP shows up as

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[26]If xi and a*xi are the contributions to Systems 1 and 2 by the residents of prefecture i, and Y1 and Y2 are the aggregate national income accounts contributions to Systems 1 and 2, then [xi/sum(xi)]*Y1 + [axi/sum(axi)]*Y2 = [xi/sum(xi)]*[Y1+Y2], where sum(xi) is the sum of the contributions for all prefectures.

[27]We also allocated the aggregate employees and self-employed benefits on a per capita basis to each prefectures. None of the estimates changed.

statistical discrepancy, which for some prefectures, may be as large as 7 percent of the prefectural GNP.[28] Although the Japanese regional accounts appear to be of better quality than that of other nations, inferences using the Japanese regional data should be interpreted with caution.

[28]At about 7.3 percent, Nagano has the largest statistical discrepancy as a fraction of its GNP.

Table 1
(Dependent Variable: Gross Total Investment/GNP)

1. Including Kanto and Kansai

Time-averaged Period	1975-88	1975-79	1980-84	1985-88
Constant	0.47	0.52	0.44	0.40
	(15.78)	(11.95)	(13.27)	(22.93)
Gross Total Saving/GNP	-0.36	-0.44	-0.32	-0.24
	(-4.52)	(-3.92)	(-3.50)	(-4.94)
R-squared	0.24	0.23	0.19	0.19

2. Excluding Kanto and Kansai

Time-averaged Period	1975-88	1975-79	1980-84	1985-88
Constant	0.46	0.52	0.42	0.39
	(17.16)	(14.56)	(11.92)	(11.40)
Gross Total Saving/GNP	-0.30	-0.39	-0.23	-0.21
	(-4.09)	(-4.16)	(-2.42)	(-3.53)
R-squared	0.24	0.25	0.14	0.18

standard-errors are corrected for arbitrary heteroskedasticity by the method of White(1980).

t-statistics in parentheses.

Table 2a
(Dependent Variable Gross Private Investment/GNP)

1. Including Kanto and Kansai

Time-averaged Period	1975-88	1975-79	1980-84	1985-88
Constant	0.18 (15.35)	0.18 (5.32)	0.17 (13.2)	0.17 (19.23)
Gross Private Saving/GNP	0.13 (1.59)	0.17 (1.19)	0.11 (1.47)	0.08 (1.29)
R-squared	0.05	0.017	0.057	0.073

2. Excluding Kanto and Kansai

Time-averaged Period	1975-88	1975-79	1980-84	1985-88
Constant	0.18 (15.72)	0.22 (10.52)	0.18 (14.56)	0.14 (11.22)
Gross Private Saving/GNP	0.093 (1.47)	0.039 (0.53)	0.09 (1.66)	0.09 (1.44)
R-squared	0.062	0.0071	0.050	0.18

standard-errors are corrected for heteroskedasticity by the method of White (1980).

t-statistics in parentheses.

Table 2b
(Instrumental Variables Estimates)
(Dependent Variable: Gross Private Investment/GNP)
(Instrument for Gross Private Saving: Age over 65/Working Age Pop)

Time-averaged Period: 1975-88

	Including Kanto and Kansai	Excluding Kanto and Kansai
Constant	0.21	0.29
	(0.97)	(1.99)
Gross Private Saving/ GNP	0.017	-0.31
	(0.022)	(-0.55)
R-squared	0.049	0.063

(Dependent Variable: Gross Private Saving)

Constant	0.30	0.32
	(9.01)	(6.37)
Age over 65/ Working Age Population	-0.11	-0.20
	(-0.86)	(-1.08)
R-squared	0.011	0.27

standard-errors are corrected for heteroskedasticity by the method of White (1980).

t-statistics in parentheses.

TABLE A1: PREFECTURAL DATA FOR 1988 AND COMPARISON WITH NATIONAL INCOME ACCOUNT AGGREGATES

pref	GNP	CONS	GOV	NTAX	LTAX	WELF	SOCB	SOCT	PINV	PUBINV
Hokkaido	14956.22	9172.823	2070.886	1190.617	1061.116	483.405	828.5332	1505.653	2707.203	1963.155
Aomori	3259.214	2182.086	522.954	185.805	199.295	112.524	741.8186	292.3091	719.125	310.486
Miyagi	6115.161	3632.834	650.141	594.149	440.555	92.744	744.1691	463.0639	1471.644	523.008
Akita	2811.242	1757.393	359.949	164.556	171.411	86.188	724.4048	223.4785	545.562	335.918
Yamagata	2980.642	1736.78	344.941	177.666	194.657	60.432	727.6577	257.5148	605.466	318.856
Fukushima	5680.244	2770.517	547.233	339.37	391.774	89.455	740.9365	405.1158	1197.15	525.694
Ibaragi	8188.667	3861.509	815.743	597.832	573.577	79.769	729.4989	677.072	1570.45	496.867
Tochigi	5910.987	2733.884	474.782	558.266	423.505	93.082	739.9613	455.9051	1333.718	284.674
Gunma	5781.941	2922.89	444.703	501.459	398.485	221.524	731.7979	405.4124	1249.872	307.898
Saitama	18521.02	9635.922	1164.022	1453.107	1298.198	206.305	741.0251	2080.336	3709.788	781.902
Chiba	16882.41	8481.93	1081.358	1428.715	1192.667	1142.773	785.5071	1159.128	3307.788	977.618
Tokyo	57743.73	25024.08	5090.732	18847.85	4883.142	361.187	744.1198	4370.858	13814.48	2147.458
Kanagawa	26928.68	13965.4	1667.177	3146.447	1299.851	123.887	721.9074	2016.934	5420.345	1417.77
Yamanashi	2461.011	1325.209	218.277	170.316	167.403	62.699	739.4684	170.4601	574.852	209.901
Nagano	6185.56	3037.185	534.558	423.982	434.218	70.151	784.7688	529.2509	1421.168	569.294
Shizuoka	11530.9	5109.632	807.286	1140.175	922.456	48.091	722.3994	912.6861	2686.503	261.783
Toyama	3383.953	1695.232	279.586	290.968	249.03	43.886	738.0245	301.1374	779.212	262.395
Ishikawa	3322.008	1846.356	299.993	268.306	243.729	121.474	742.0171	244.5091	716.059	388.605
Gifu	5770.919	3092.748	469.055	456.432	412.049	87.369	766.5917	488.759	1231.948	1043.7
Aichi	23460.65	10144.13	1378.202	3545.142	2047.936	133.273	740.1956	1879.324	5949.01	351.082
Mie	5435.068	2386.332	411.635	475.733	372.086	352.852	753.6239	439.1501	1007.288	276.642
Fukui	2357.943	1241.952	234.296	192.022	200.857	100.59	773.5637	204.2155	662.129	190.402
Shiga	3958.53	1820.767	268.493	252.581	271.399	61.203	736.5463	256.8549	884.236	360.208
Kyoto	8023.357	4419.718	684.463	999.216	612.059	195.882	787.3129	645.6989	1608.253	1395.524
Osaka	31002.9	14361.38	2050.588	5635.426	2762.344	636.306	763.7753	2945.736	6316.745	1080.499
Hyogo	15892.5	8721.073	1174.16	1723.648	1275.152	335.548	747.9123	1206.757	3133.722	237.521
Nara	3155.744	1794.446	375.161	207.86	237.959	80.927	743.1414	253.9285	591.91	207.861
Wakayama	2722.978	1461.239	270.609	281.827	188.217	80.639	752.7464	231.0478	623.909	184.317
Tottori	1560.59	898.237	193.411	88.524	97.861	44.762	769.0085	149.3333	292.708	225.644
Shimane	1853.756	1065.036	260.553	102.011	119.209	57.85	785.6819	177.8409	386.056	225.644
Okayama	5694.287	2904.034	488.17	525.903	394.82	124.7	782.1517	396.7511	1189.052	351.467
Hiroshima	8564.612	4810.254	753.199	825.49	637.299	159.272	793.9519	824.3883	1796.231	633.738
Yamaguchi	4387.808	2423.353	449.082	373.773	316.048	101.749	810.6314	373.5817	939.767	333.72
Tokushima	2042.71	1151.271	269.304	125.984	135.236	69.932	743.5807	168.9243	385.212	189.761
Kagawa	2893.868	1586.596	282.741	297.121	206.816	61.933	795.787	257.23	633.68	161.6
Aichi	3670.316	2172.101	348.411	269.692	1143.747	352.852	752.9352	320.2511	817.748	306.69
Kochi	1850.158	1243.566	259.504	119.88	120.292	91.991	780.7216	163.0696	359.747	230.226
Fukuoka	13518.33	7269.858	1219.597	1171.883	920.606	391.544	793.5768	977.4846	3060.261	731.299
Saga	2113.29	1192.114	229.519	130.784	130.77	54.121	779.5224	154.8266	415.257	250.295
Nagasaki	3434.393	1876.656	486.473	186.529	212.411	137.375	780.4317	278.8223	702.709	353.962
Kumamoto	4552.637	2557.036	531.834	246.931	260.575	131.278	780.0583	342.5288	946.623	449.755
Oita	3120.28	1718.351	356.483	205.218	194.13	83.727	757.7629	260.8968	635.493	283.952
Miyazaki	2628.661	1543.152	315.232	145.866	155.578	81.351	826.768	192.2371	605.836	291.694
Kagoshima	3981.822	2613.621	515.219	213.381	291.912	127.342	795.2765	300.3066	799.565	463.051
Okinawa	2565.271	1480.564	441.049	193.755	153.347	88.929	905.9238	187.494	554.823	340.227
Totals	372857	188841.2	32090.76	50472.2	28415.78	7724.873	34427.2	30548.26	80170.3	23233.76
National Accounts	379230	218234	34565	52194	30117	6285	36309.5	31905.1	88800.7	24883.9

Note: NTAX, National Tax. LTAX, Local Tax. SOCB, Social SOCB, Social Security Benefits.
SOCT, Social Security Tax. PINV, Private Investment. PUBI, Public Investment.
In Billions of Yen.

Figure 1(a)

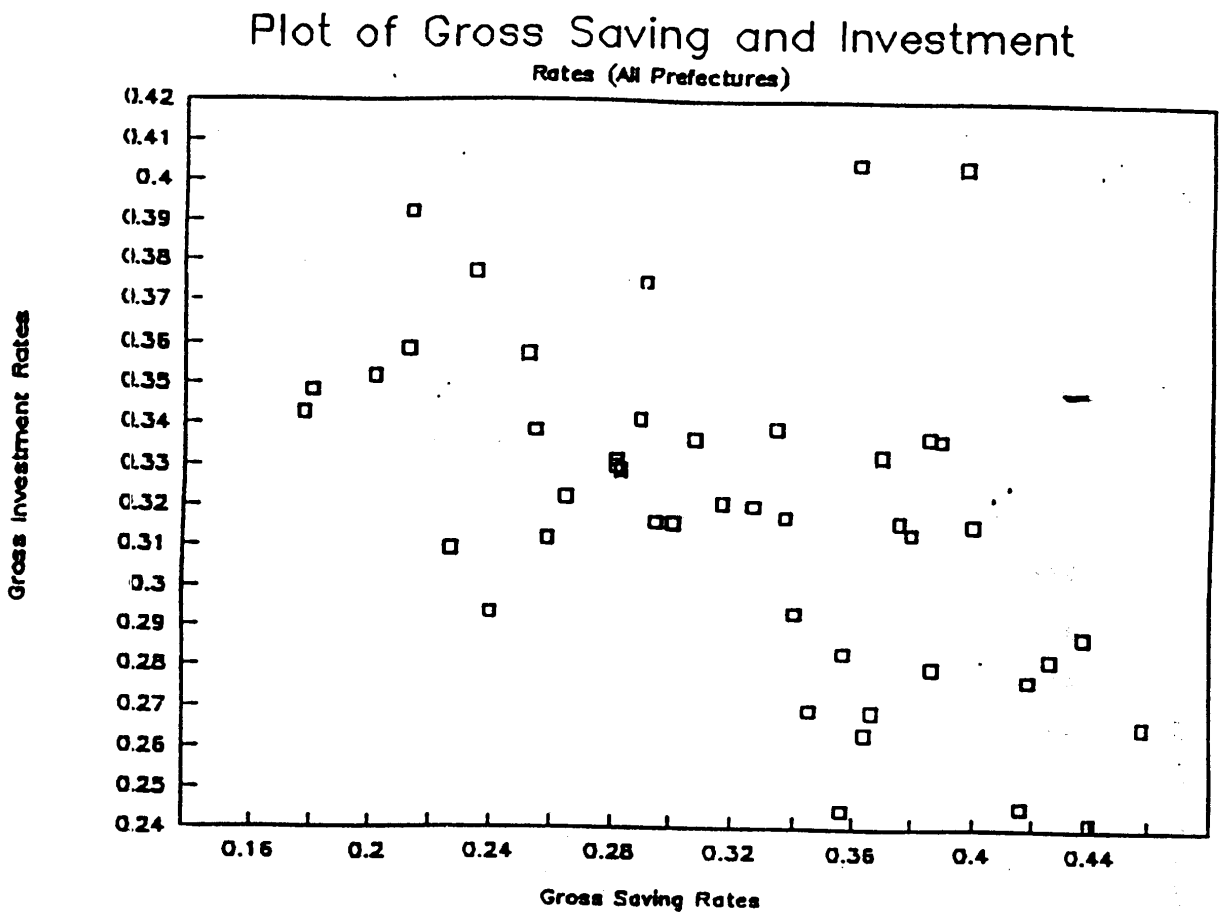


Figure 1(b)

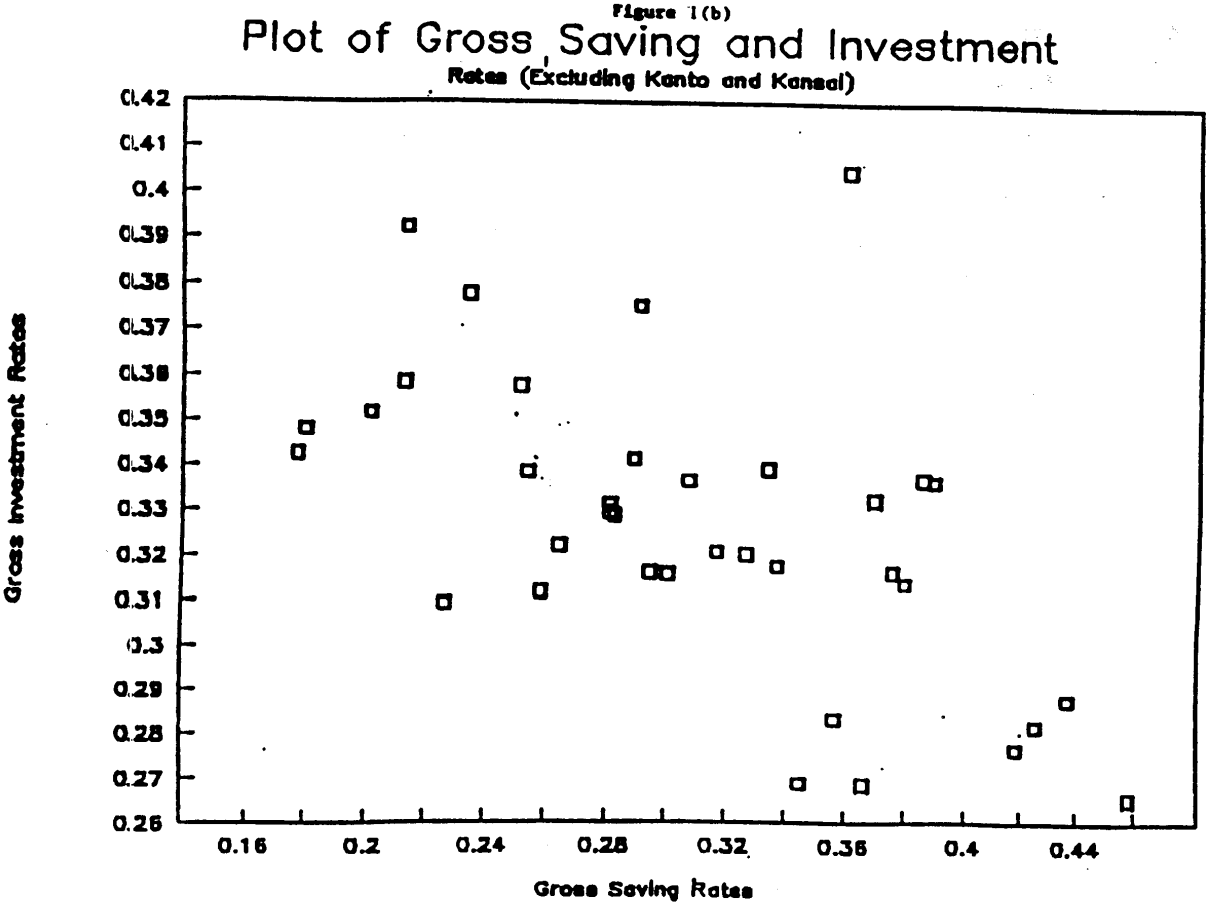


Figure 2

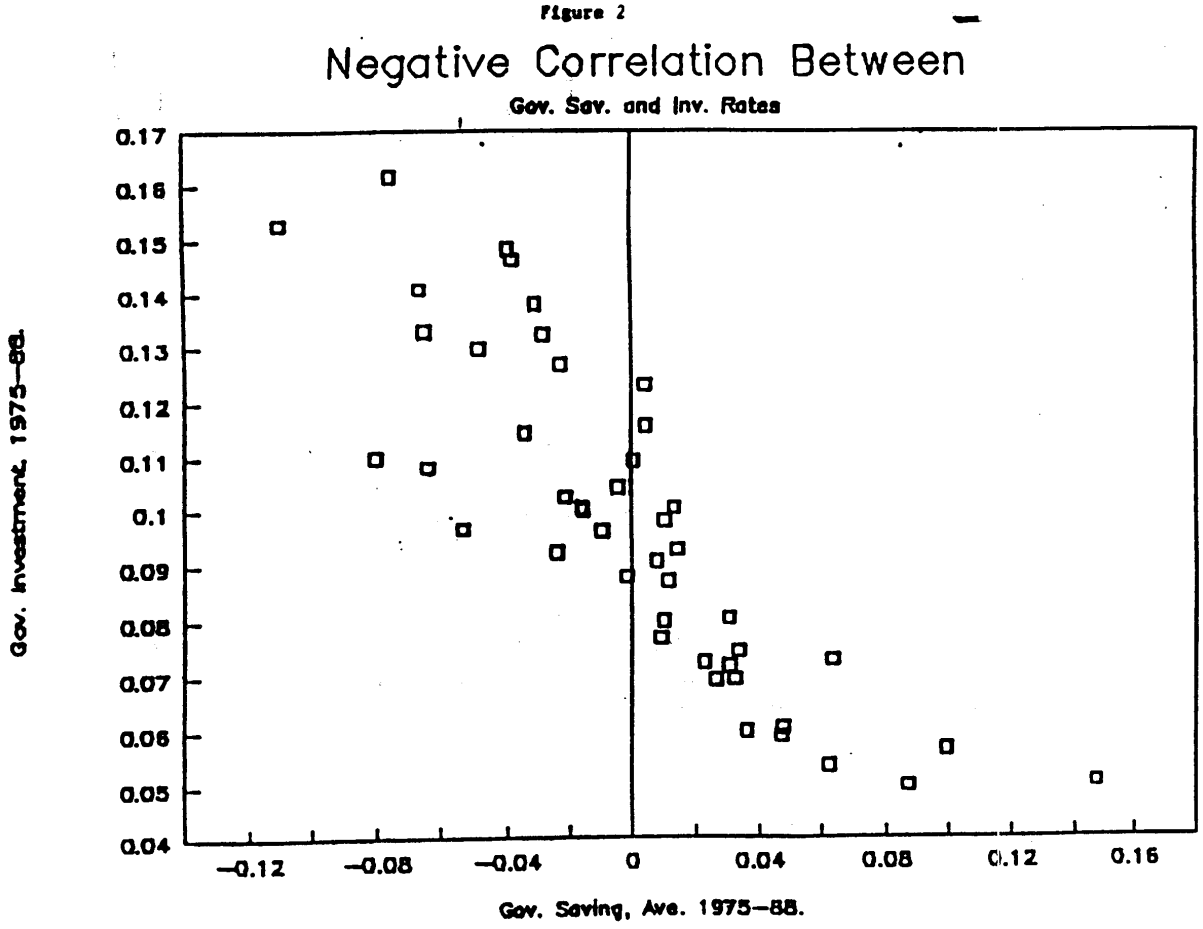

Negative Correlation Between
Gov. Sav. and Inv. Rates
Gov. Investment, 1975–88.
0.17
0.16
0.15
0.14
0.13
0.12
0.11
0.1
0.09
0.08
0.07
0.06
0.05
0.04
−0.12
−0.08
−0.04
0
0.04
0.08
0.12
0.16
Gov. Saving, Ave. 1975–88.

Figure 3(a)

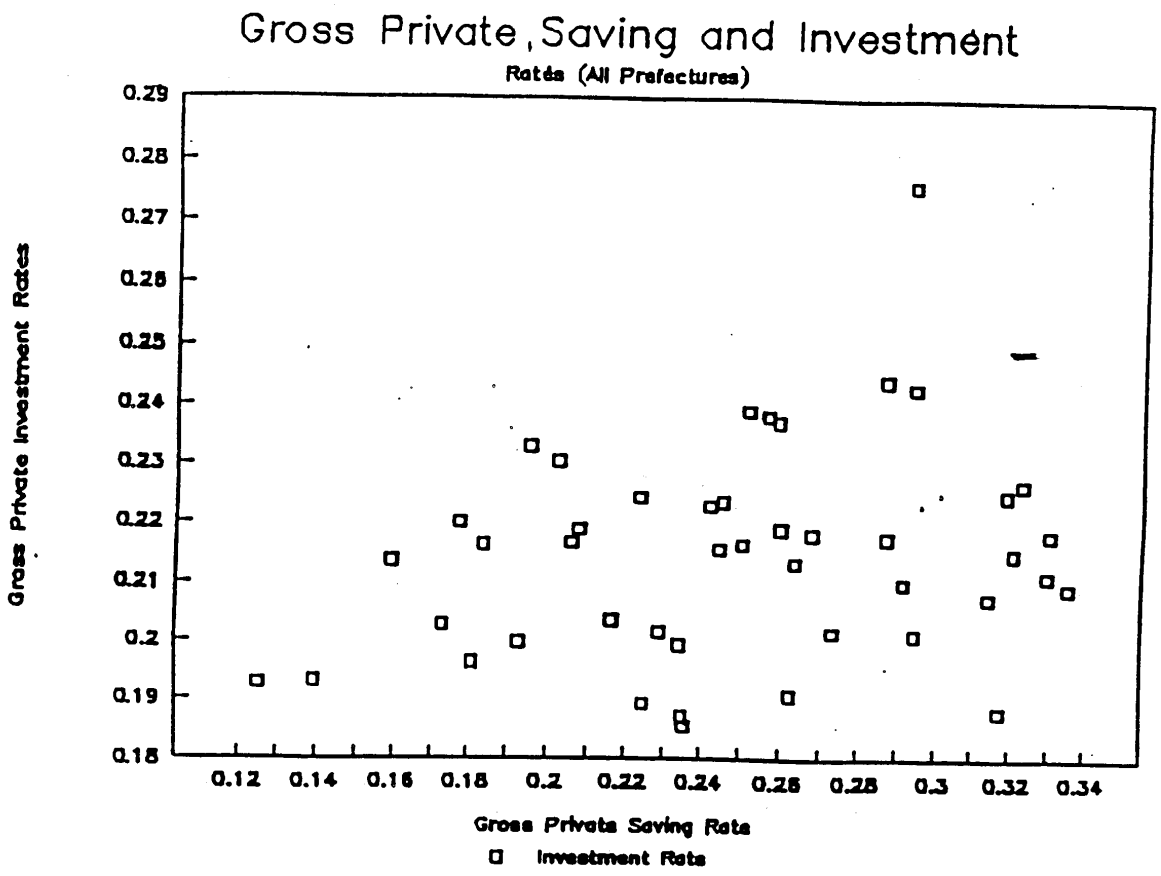


Figure 3(b)

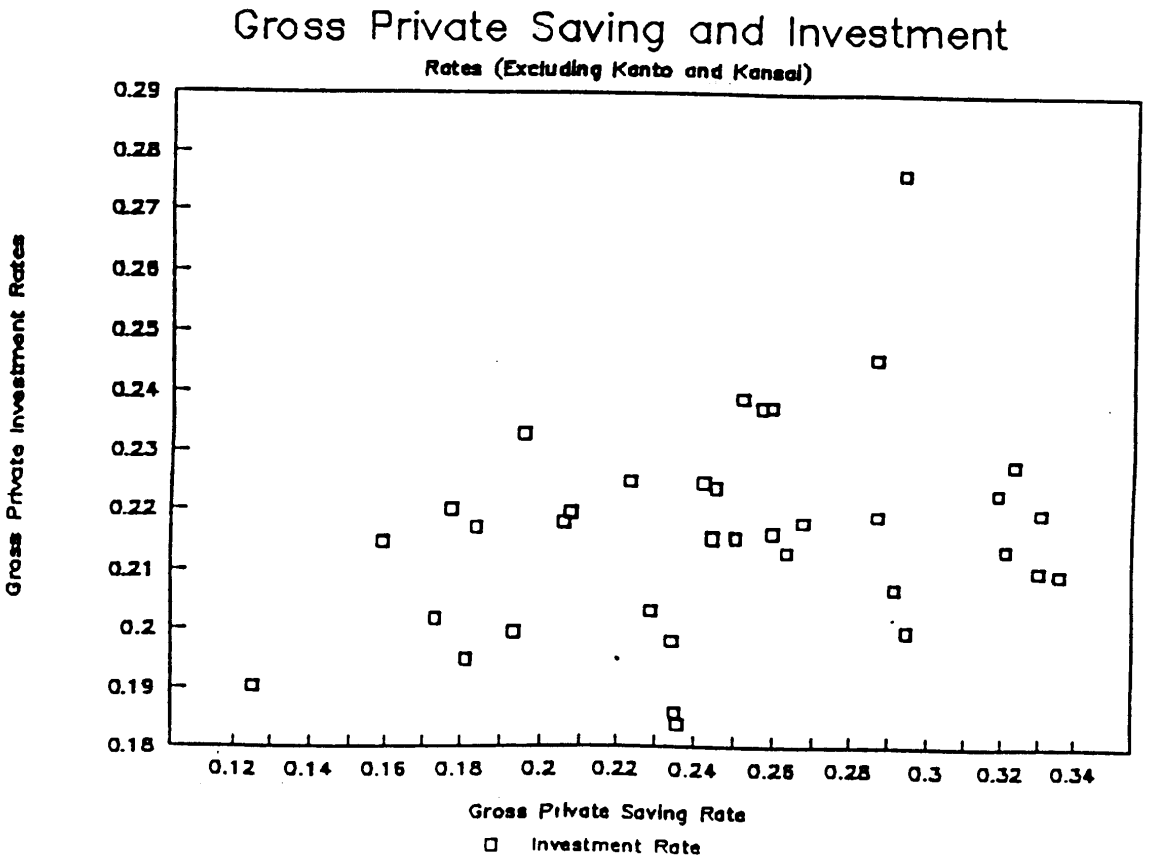


Figure 4(a)

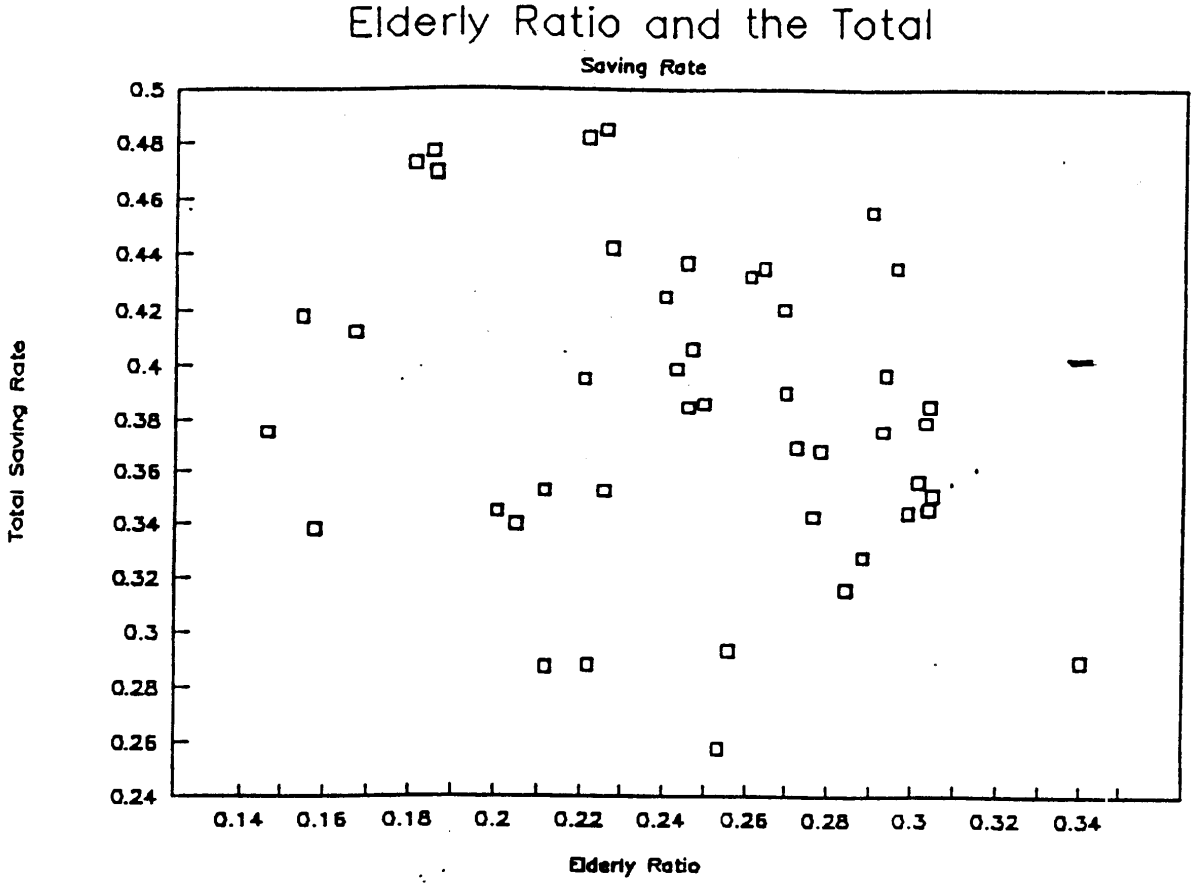


Figure 4(b)

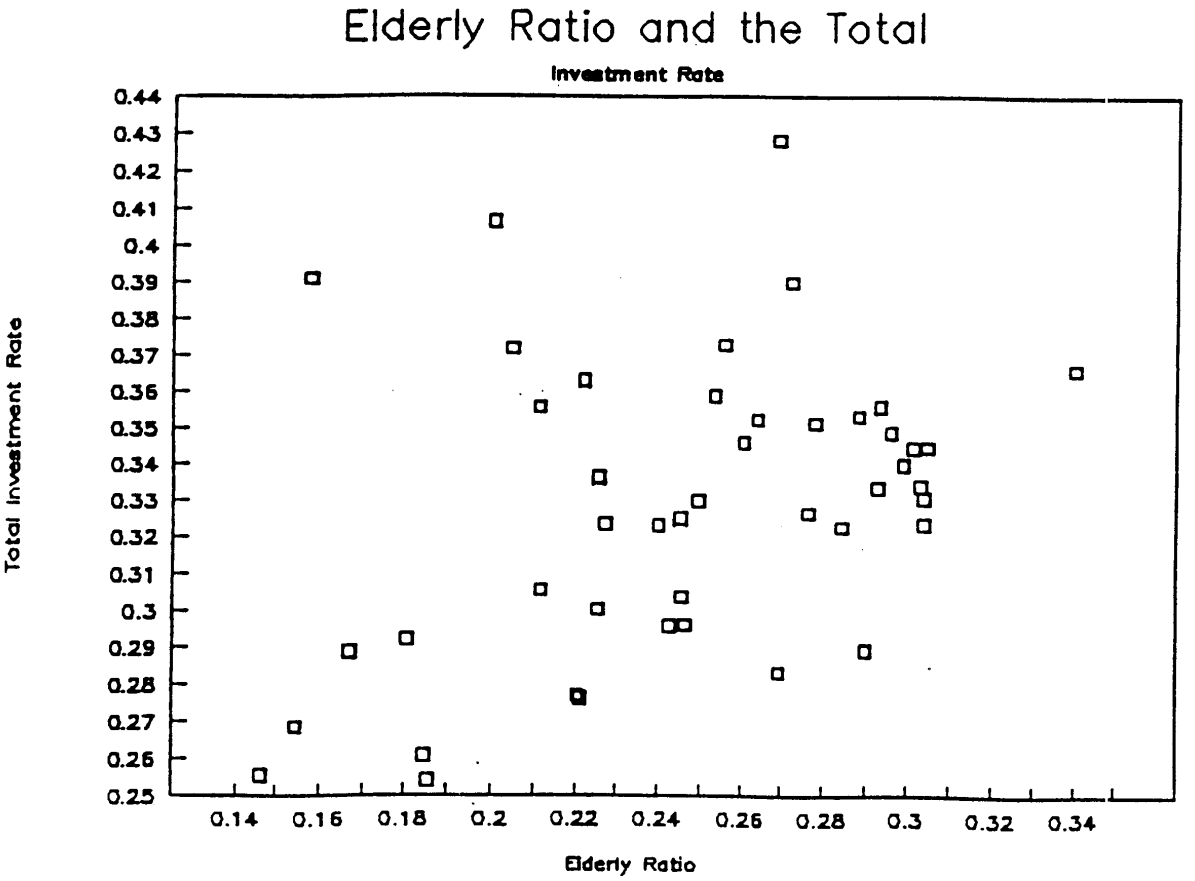


Figure 5(a)

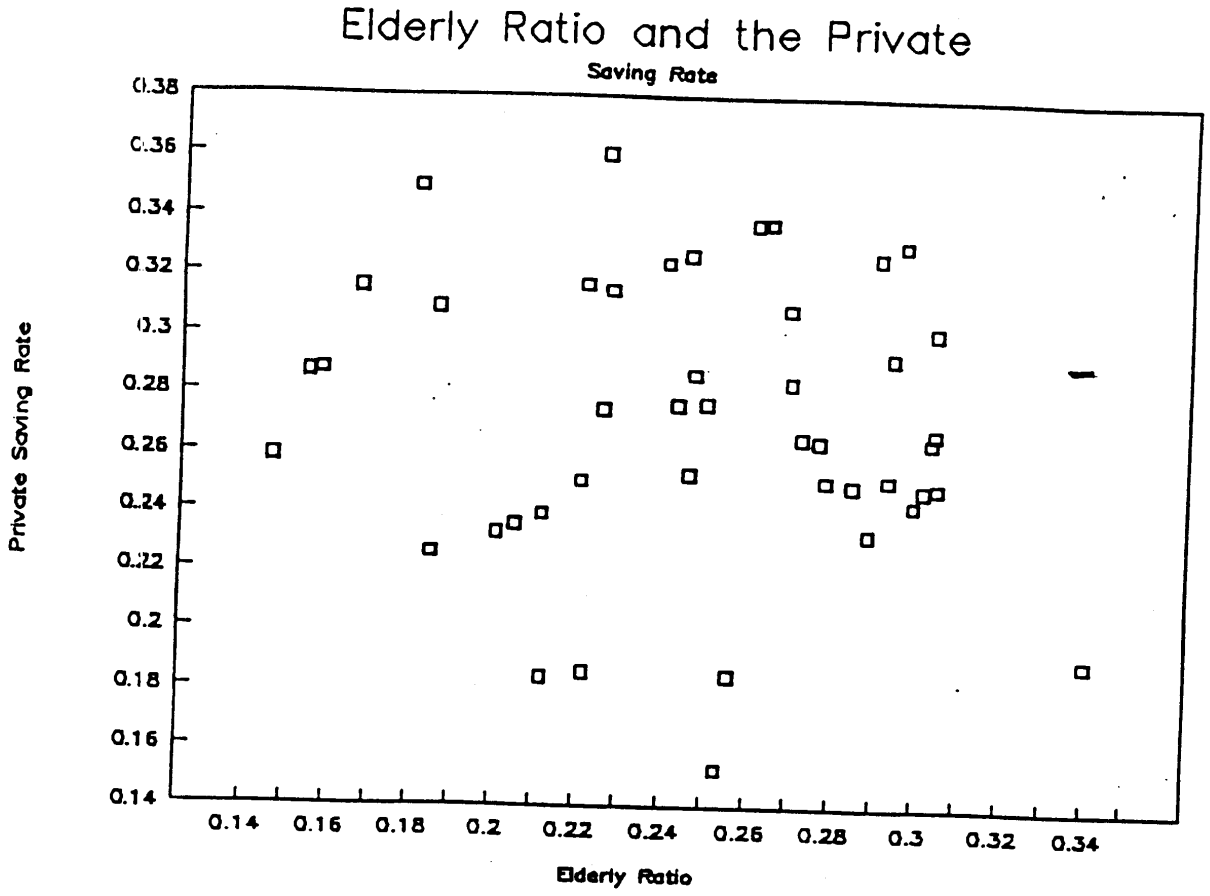
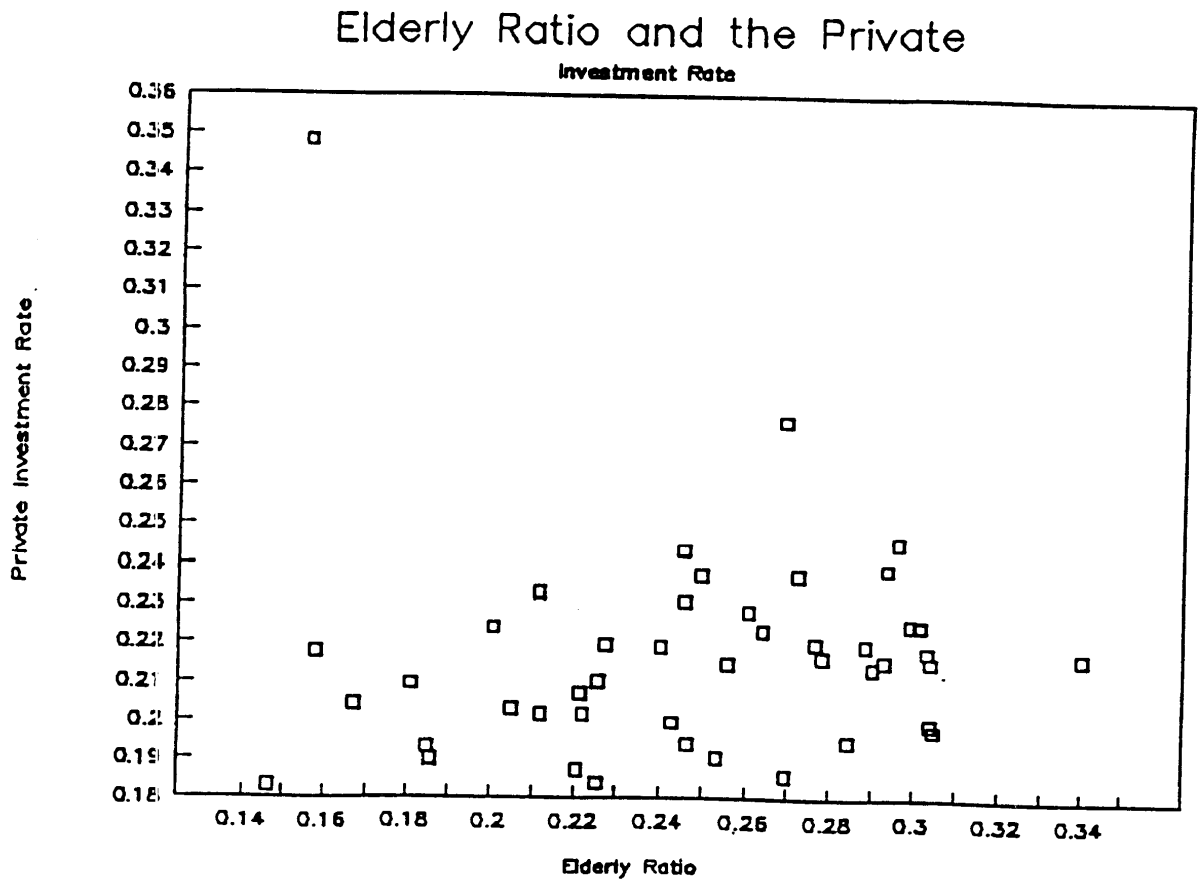


Figure 5(b)



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