THE PROPENSITY TO ITEMIZE IN THE CONTEXT OF A HUMAN CAPITAL MODEL

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Abstract

The decision whether or not to utilize the "long-form" and itemize deductions depends on income and non-income factors. The distribution of these factors among the various States tends to be stable over long periods of time. It follows that the federal individual income tax (FIIT) may be associated with a systematic deviation from location—neutrality. This is argued to be especially germane in periods associated with major reforms in the tax codes.

It is suggested that this phenomenon is explicable in terms of a human capital model. The decision in any given year to itemize is a function of past accumulation of specific and specialized human capital. The effect of a tax reform is a large scale destruction of such capital. Therefore, certain predictions concerning the time path of the "propensity to itemize deductions" (PID) follow. Empirical support for this model is found from cross-section data at the State level, from years both preceding and following the 1986 Tax Reform and Simplification Act (TRA).

I. Introduction

Currently, we face what is considered by many the greatest set of revisions in the Federal tax codes since the 1986 Tax Reform Act (TRA). Starting with the passage of the balanced—budget amendment in the House, the Congressional "Conservatives" promise what is believed to be a veritable revolution in the nation's tax structure. In order to correctly gauge likely inter-State distributive and other effects of the yet unspecified changes, it is essential to correctly determine the likely reaction of the tax paying public. This article describes the changes in the tendency to itemize following the 1986 TRA, and estimates the effects of economic and locational determinants on these changes.

The federal individual income tax (FIIT) is characterized by horizontal equity. Theoretically, any two individuals or households with equal income should pay the same tax. However, this horizontal equity concept is regularly violated. It has been amply demonstrated that effective FIIT rates tend to differ significantly by locale (see Izraeli and Kellman 1980, 1990). An important reason for this is that some taxpayers itemize while others do not; this creates different Taxable Incomes for households with equal Adjusted Gross Incomes (AGI). Since the decision to itemize is affected, in part, by certain non-income factors, the same AGIs are often effectively taxed at different rates. Furthermore, since the inter-State differentials for these non-income factors tend to be maintained over time, a systematic inter-State bias becomes evident in the FIIT.

The theoretical framework is outlined in the next section. The empirical tests are discussed in Section 3 followed by the conclusion.

II. The Tax Related Human Capital (TRHC) Model

An extensive literature explores the correlates and determinants of deductibility. Studies in this area unanimously identify income as the major, if not the sole, relevant economic factor. The reasoning is that "[for] the low income groups, the issue of deductibility is not very important simply because the proportion of itemized federal tax returns is so low . . . In the upper groups, a high incidence of itemization [is

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found] together with high marginal tax rates." (Feenberg and Rose, 1985, p. 11). The exclusive association of the tendency to itemize with income is echoed in Gramlich (1985) and Kenyon (1985). The theoretical base for this view seems straightforward. The high income groups itemize due to both relatively high marginal tax rates and relatively high propensities to consume tax deductible items (e.g. housing).

We argue here that explanations of the propensity to itemize solely as a function of income are too simplistic. As such, they result in flawed and under-specified models for policy analysis purposes.

The key assumption of our model is that the decision to itemize is essentially an investment decision. This decision involves a high initial fixed outlay and an accumulation of a very specific capital stock over time.

This is clearly the case in times of major tax revisions. Professional tax consultants must relearn the minutiae of the revised tax laws. At the same time they must examine the characteristics of alternative, extensively revised software packages, and carefully consider the implications of the flood of new challenges and decisions in the various administrative panels and tax courts.

The same model would apply to that segment of taxpayers who do not utilize the professional services of tax lawyers, accountants or preparers. This group also faces high setup costs in times of major tax code revisions.[1] The following, admittedly prosaic description, illustrates the point. The taxpayer must master certain fundamental snippets of tax law, such as which expenditures are in fact deductible. He/she would then have to "dig through the shoe box" to locate receipts, typically with a low probability of success. After bearing the psychological shock associated with first encountering the obfuscation of the "Long Form", with its innumerable attachments, codas, schedules and appendices, considerable time and effort need be expended putting it all together. Due to the lack of an initial systematic approach (e.g. a dearth of recorded journal entries, or the total absence of receipts and records), the cost/benefit ratio of this endeavor will doubtless be high for the first time itemizer.

Compare this situation with that faced by the same taxpayer several years later. The systems are now in place. Records and canceled checks are easily available. Copies of prior years' tax forms serve as tableaus and models. In the absence of further major tax revision, the prices of popular tax-preparation software packages will fall.[2] The cumulation of past investment is paying off; the cost/benefit ratio of the itemization process clearly falls. Over time, the quantity and quality of tax-specific human capital accumulated by the taxpayer will have increased and improved. This capital will be embodied in many forms which may be difficult to quantify. Over time the taxpayer's estimates of IRS "reasonableness parameters" will improve. Various tax avoidance measures will become increasingly effective with growing awareness of recent marginal relevant changes and developments in tax courts. All this, plus an overall lowering of "generalized anxiety", will tend to continuously lower the relevant cost/benefit ratio. This process of decreasing itemization costs will tend to occur at a decreasing rate, as the new optimal level (with respect to the new tax environment) of tax related human capital (TRHC) is approached.

Though the framework of analysis described above is only roughly sketched out, several inferences may be drawn. The decision to itemize involves inter-temporal investment considerations. It will therefore be affected not only by immediate cost/benefit factors typically involving personal income levels, but also by anything which may affect expectations concerning future changes in the tax code or level of enforcement. Anything which might affect the taxpayer's rate of time preference will additionally influence the decision to itemize.

It follows that the decision to itemize is likely to be affected by a large set of parameters. Little confidence should be associated with predictions of a model involving solely the bivariate income-PID relationship. This is especially true in periods of tax code changes and reforms, during which times those parameters would tend to deviate from their long run equilibrium values.

To attempt to estimate a fully articulated and specified model at this point is beyond the scope of this paper. Instead, we will demonstrate in this section that a general TRHC model is

supported by actual empirical relationships observed at the State level.

What empirically observable inferences or predictions follow the general TRHC model? First, we would expect to find PIDs significantly affected by factors other than income. This follows from the fact that PID is a function of a stock of human capital, the accumulation of which may occur over several years. In any given year characteristic of a "stationary" period, the changes in TRHC relative to its stationary level will tend to be small. However, in a period involving a major tax reform, the changes would be expected to be large and discrete, the result of a major one time destruction of much of the stock. In such a period, the stock level of TRHC will tend to be far from its equilibrium level.

Second, we would expect that during periods immediately following a major tax reform, the changes in PID are likely to be more distinct and sharp than in more "stationary" periods. Following a standard (Jorgenson) stock-adjustment capital model, the change in TRHC will tend to be relatively large immediately following such a reform when the gap between the equilibrium capital stock K_e and the immediate post-reform stock K is a large one:

$$I_t = \alpha (K_e - K_t$$
$$0 \leq \alpha \leq 1$$

where I_t is the investment in TRHC,

K_t is the stock of TRHC at time t, and

K_e is the equilibrium stock of TRHC, conditional upon the specific tax environment.

alpha is the adjustment parameter.

Third, we would expect PID to follow a rising trend during stationary periods and a falling trend in periods immediately following substantial tax revisions or reforms. This will yield a U-shaped or mean-reverting pattern over time. The reasoning is as follows. Over time, as the reform, the large fixed cost of adapting to the new tax environment will dominate, and result in a drop in mean observed PID levels.

Finally, we would expect to observe certain systematic time paths in the inter-State variation of PIDs. In the long run, as the effects of the large fixed costs of adapting to the new tax environments fade, and as the logistic effects of diminishing marginal returns come into play, the PID differentials between States should tend to decease. However, in the short run, following major tax revisions, the results will be dominated by the effects of inter-State differences in "fundamentals" affecting the perceived present value of investment in TRHC. Hence, in this period, we would expect relatively large or increasing inter-State variance measures.

III. Empirical Tests

The first test involves a two stage demonstration. First, the propensity to itemize deductions (PID) is shown to depend systematically on variables other than income. Second, these variables are demonstrated to exhibit inter-State differentials which are relatively constant over time. The regression results summarized in this section are from 1990, the most recent year for which data were available.

The first specification estimated is a standard one, in which PID is a function solely of an income variable:

[1] $PID_i = f)PCAGI_i$,

where PID_i is the ratio of itemized returns over all returns in 1990, for each of i = 1. .51 States.

$PCAGI_i$ is the per capita adjusted gross income in each of the 51 States (including the District of Columbia).

The results of this regression estimation are:

Parameter Estimates

Variable	Parameter Estimate	Standard Error	T for HO: Parameter = 0	Prob > |T|
INTERCEPT	14.835777	4.19225798	3.539	0.0009
PCAGI	0.469759	0.14969979	3.138	0.0029

model converges to its long run equilibrium, the human capital stock specifically applicable to the existing tax codes will increase, systematically lowering the cost of itemizations.[3] However, in the brief period following a major tax

As expected, PID is quite significantly and

positively affected by per capita income. Those States with relatively higher per capita incomes are also the States in which the proportion of itemizers is relatively the highest. As indicated, this is a standard finding in the literature. The adjusted $R^2 = .15$.

Next the relationship was re-specified. Additional variables which may be argued to affect PID independently of income were added to the equation. The new specification is:

[2] $PID_i = f(PCAGI_i, URB_i, U_i)$ [4], where

URB_i is the rate of urbanization. It is defined as the proportion of the population living in SMSAs of at least 50,000 (in each State).

U_i is the rate of unemployment in each of the i States.

The expectations which are consistent with the model are that PCAGI, URB and U should all exhibit positive coefficients. The reasoning for this is as follows:

PCAGI—As noted, all studies have found income to be positively associated with the tendency to itemize. The reasons have been discussed in this paper, and are part of the conventional wisdom.

URB—This variable may be viewed as a proxy for a positive scale economy factor. A taxpayer living in a densely populated urban setting is more likely to have easy access to a competitive supply of tax-preparation services; and to specialist services (e.g. international tax-law consultants, specialized stationary or software). Hence a positive sign is expected here.

U—The expectation for this variable is a positive sign. Since the value of time tends to be lower for the unemployed, the cost of the required investment will be relatively low (at any given level of income).

The results from this specification are as follows:

This model, whose regression has an adjusted $R^2 = .36$, represents a specification superior to the preceding one. The proportion of explained inter-State variation in the PID more than doubles. The signs of both PCAGI and URB are significantly positive. The coefficient of U is not significant.[5]

Finally, having documented in earlier work that the PID tends to differ systematically between regions in the U.S., and that these inter regional patterns tend to remain stable over long periods of time (Izraeli and Kellman, 1980 and 1990), the model was re-estimated, adding the following regional dummy variables:

SDUM—for the Southern States
WDUM—for the Western States
NEDUM—for the North Eastern States
MWDUM—for the Mid Western States.

This model was estimated four times, each time omitting one of the dummy variables. In each case, the resulting adjusted R square was 0.43. The table on page 5 shows the results obtained.

The proportion of itemizers were found to be greater in the Northeast when compared to the respective itemizer proportions in the South and Midwest.

Having found the PID to have been significantly affected (in an economically sensible manner) by variables other than income, it remains necessary to demonstrate that these variables maintained a constant pattern of inter-State differentials over time. In the case presented here, the only significant non-income explanatory variable is the URB—the rate of urbanization. The simple correlation coefficient between the urbanization rates in 1981 and 1990 was 0.994. The constancy of these distributions over the course of the decade is graphically demonstrated in Figure A5 in the Appendix.

The second inference tested is the expectation

Parameter Estimates

Variable	Parameter Estimate	Standard Error	T for HO: Parameter=0	Prob > |T|
INTERCEPT	12.652411	5.58939161	2.264	0.0283
PCAGI	0.282363	0.13789273	2.048	0.0462
URB	0.175126	0.04565927	3.835	0.0004
U	−0.872272	0.59568720	−1.464	0.1498

Parameter Estimates				
Variable	Parameter Estimate	Standard Error	T for HO: Parameter = 0	Prob > |T|
INTERCEPT	17.320855	5.57262514	3.108	0.0033
PCAGI	0.141248	0.14919376	0.947	0.3489
URB	0.146286	0.04664446	3.136	0.0030
U	−0.937120	0.60053568	−1.560	0.1258
SDUM	−0.506799	1.85681655	−0.273	0.7862
WDUM	2.159664	1.84727599	1.169	0.2487
NEDUM	4.845048	1.95683572	2.476	0.0172
INTERCEPT	22.165903	6.34294127	3.495	0.0011
PCAGI	0.141248	0.14919376	0.947	0.3489
URB	0.146286	0.04664446	3.136	0.0030
U	−0.937120	0.60053568	−1.560	0.1258
SDUM	−5.351848	1.94478956	−2.752	0.0086
WDUM	−2.685384	2.00796204	−1.337	0.1880
MWDUM	−4.845048	1.95683572	−2.476	0.0172
INTERCEPT	19.480519	5.76083736	3.382	0.0015
PCAGI	0.141248	0.14919376	0.947	0.3489
URB	0.146286	0.04664446	3.136	0.0030
U	−0.937120	0.60053568	−1.560	0.1258
SDUM	−2.666463	1.87069167	−1.425	0.1611
NEDUM	2.685384	2.00796204	1.337	0.1880
MWDUM	−2.159664	1.84727599	−1.169	0.2487
INTERCEPT	16.814056	5.78153269	2.908	0.0057
PCAGI	0.141248	0.14919376	0.947	0.3489
URB	0.146286	0.04664446	3.136	0.0030
U	−0.937120	0.60053568	−1.560	0.1258
WDUM	2.666463	1.87069167	1.425	0.1611
NEDUM	5.351848	1.94478956	2.752	0.0086
MWDUM	0.506799	1.85681655	0.273	0.7862

that the tendency to itemize (PID) would be apt to change more dramatically following the 1986TRA than it had in the period preceding the tax reform. An examination of the rank correlation coefficient on PIDs in 51 State observations supported this expectation. The rankings of the States in terms of their respective taxpayers' tendency to itemize remained practically unchanged during the five years preceding the 1986 TRA. The Spearman (rank) correlation coefficient between PIDs in 1981 and 1986 was 0.93. As seen in Table 1, the TRA was accompanied by a noticeable change.

During the early 1980s, the rankings of the relative degree to which taxpayers tended to itemize changed very slowly. From 1981 to 1986, the rank correlation fell an average of 1.4 percentage points per year (from 1 to 0.93 over a five year period). In the four years following the 1986 TRA, the stability of the rankings was clearly disturbed. From 1986 to 1987, the rank correlation fell by a full 6 percentage points, practically matching the change of the preceding quinquennium. From 1986 to 1990, the correlation coefficient fell by a full 15 percentage points. The PID rankings seemed to have stabilized by the late 1980s, showing very little

TABLE 1
Spearman Rank Correlation Between the Propensity to Itemize (PID) in 1981, and PIDs of Subsequent Years

Years	
1986	0.93
1987	0.87
1988	0.84
1989	0.79
1990	0.78

change from 1989 to 1990. Thus, most of the change occurred in the two or three years immediately following the tax reform act.

The third inference tested was the expectation that over long periods of time, the mean level of PID should be expected to rise; and that in the period following a major revision to the tax code, it should be observed to fall. The results are summarized in the following table:

TABLE 2
State—Average Propensity to Itemize 1981–1990
Selected Years
(Percent of All Returns)

Years	Percent %
1981	31.6
1986	37.8
1987	33.2
1988	28.3
1989	28.1
1990	27.8

From 1981 to 1986, the propensity to itemize increased by roughly 20%, rising from 31.6% to 37.8% of all returns. This trend was clearly reversed following the 1986 TRA, when the propensity to itemize (PID) decreased sharply over a period of two years (to 1988). The downward trend noticeably slowed down three and four years following the tax reform (see Figure A3 in Appendix). These observed trends are consistent with the TRHC model. The early period confirms the expectation that in a period between shocks, we would expect to find an upward trend, as relevant human capital stock is accumulated. The sharp decrease immediately after the passing of the tax reform is also as predicted by the model. Even though the actual provisions of the reform were phased in over a longer period, the very expectation of changes rendered obsolete a large percentage of the erstwhile relevant capital accumulated to that point.[6] Finally, the slowdown in the downward trend after two years suggests that after two years, PID rapidly converged to its new equilibrium value.

The fourth and final inference tested deals with the inter-State variation of the PID responses to the tax code revisions. As noted, the expectation is that in the long run, the dispersion should tend to decrease, perhaps asymptotically approaching some equilibrium level. In the period immediately following the tax reform, the PID variation should be observed to notably increase. The results, in the form of the coefficient of variation, are noted in the following table:

TABLE 3
The Coefficient of Variation of State-Average PID
1981–1990
Selected Years

Years	Coefficient of Variation %
1981	19.1
1986	15.1
1987	16.1
1988	19.2
1989	18.9
1990	21.0

The results (presented in Figure A1 in the appendix) support the model. In the five year period preceding TRA, inter-State variation in the tendency to itemize fell from 19.1% to 15.1% of the mean. On the other hand, during the period following the TRA, a continual rise was observed from 15.1% in 1986 to 21% in 1990. As noted earlier, this supports the inference deduced from the model. In the long run, as the effects of the large fixed costs of adapting to the new tax environments fade, and as the logistic effects of diminishing marginal returns come into play, the PID differentials among States should tend to decrease. However, in the brief period following major tax revisions, the results are dominated by the effects of inter-State differences in "fundamentals" affecting the perceived present value of investment in TRHC. Hence, in this period, we would expect relatively large or increasing inter-State variance measures.

This conclusion is supported by observations on higher moments of the distribution. The skewness measures are in Figure A2 in the Appendix. Between 1981 and 1986 the measure remained close to 0. However, in the post TRA period, there is a clear and persistent movement away from symmetry. Observations of changes

in the kurtosis of the PID distribution again support the model, as seen in Appendix Figure A4. Between 1981 and 1987 there was a clear upward trend indicating an increased tendency toward increased inter-State concentration around the mean PID. Following 1987 there is a sharp reversal in this trend, and a clear decrease in this propensity. The mean PID tended to become less "representative" as the relative weight of the "outlier" states (those relatively far from the mean) increased immediately following the TRA.

IV. Conclusion

It is highly likely that the "Contract with America" currently being pursued by the new Congressional leaders will result in major changes in the government budget. Whether or not this is accompanied by an actual balanced budget, it is widely believed that we are faced with a major set of revisions in the federal tax structure. If the trends in the tendency to itemize follow the patterns which accompanied the last major tax reform, the 1986 TRA, we can expect a growing inter-State disparity and growing skewness in the tendency to itemize. This phenomenon is explainable in terms of the need to "retool" in the context of a tax specific human capital model with high "up front" fixed costs. In this paper, the model is given consistent empirical support by various statistical tests applied to data grouped at the State level. The results suggest that we may expect to see a systematic short-lived run deviation away from location neutrality of the federal income tax system in the near future.

NOTES

1. We cannot provide estimates of the full costs involved. However, indicative are official IRS estimates: in 1993 the preparation of the 1040 "long-form" involved an average of 10.5 hours as compared to 2.4 hours for the "short form 1040-EZ."
2. It would be premature to estimate exact dollar figures for the relevant relative costs with our exploratory model. However, the following may be indicative of the ball-park magnitudes involved. A version of Parson's tax-preparation program Tax Edge for 1994 costs $19, while previous users must pay only $16. If a similar 15% discount characterized each year's savings associated with previous use of the program, the costs of purchasing such a program would roughly halve in five years.
3. Illustratively, in 1987 the cost of Parson's tax preparation program, Tax Edge was $49. At that time it had few competitors in its price range. By 1994, the updated Parson's program cost only $19.00.
4. As noted, we did not seek to present a full blown, fully specified and articulated model. Our goal is satisfied if we can illustrate our point with a stripped down "generic" model.
5. One might be tempted to attribute the lack of significance to a high degree of multicollinearity between U and PCAGI. However, as pointed out by an anonymous referee, there is no reason to expect a high degree of correlation between these two variables in a cross section sample such as ours. An examination of the data confirmed this fact.
6. In the specific case of TRA, the observed falling PID levels may not provide strong support for the dynamics of the TRHC model, since the TRA revisions were specifically designed to bring about a decrease in PID. Thus, the observed values are a combination of both dynamic and comparative-static effects.

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APPENDIX

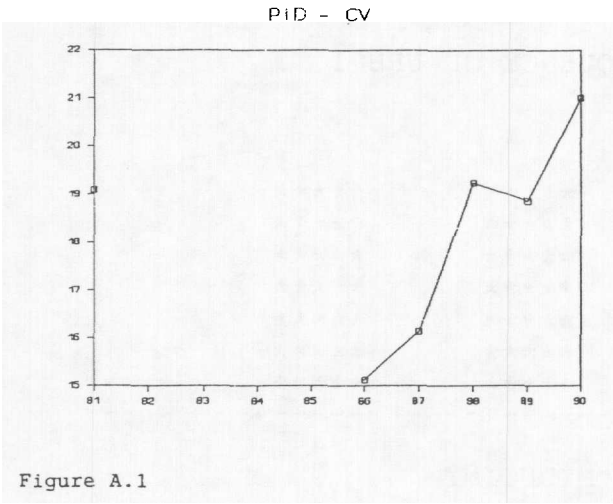


Figure A.1

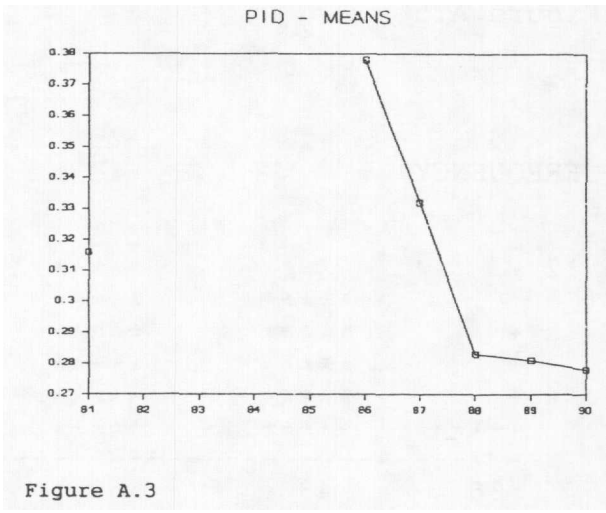


Figure A.3

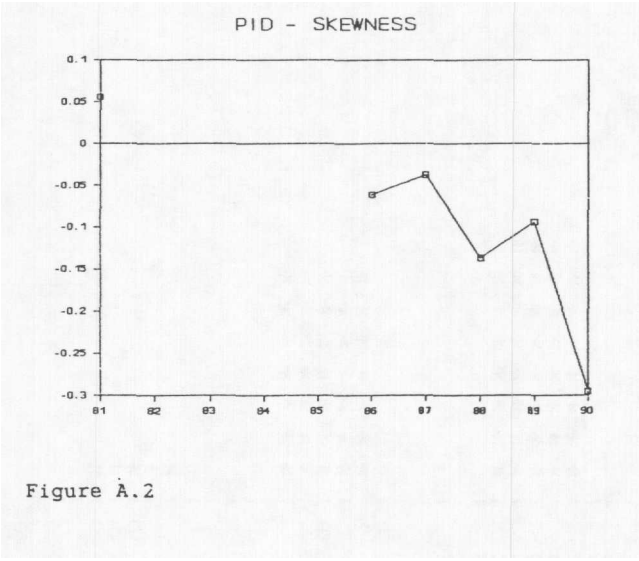


Figure A.2

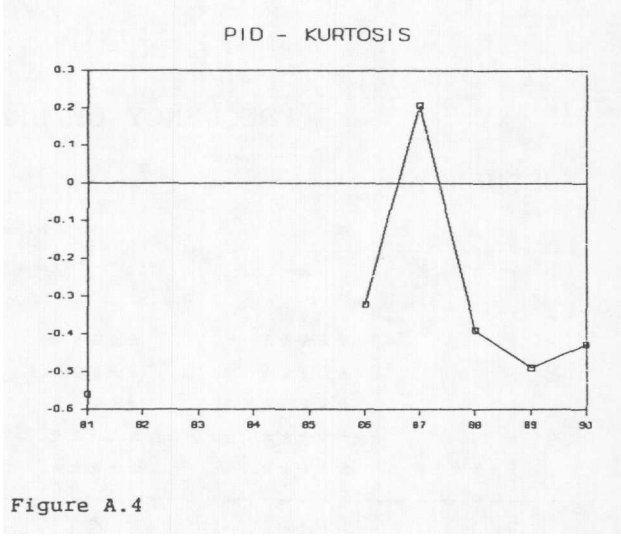
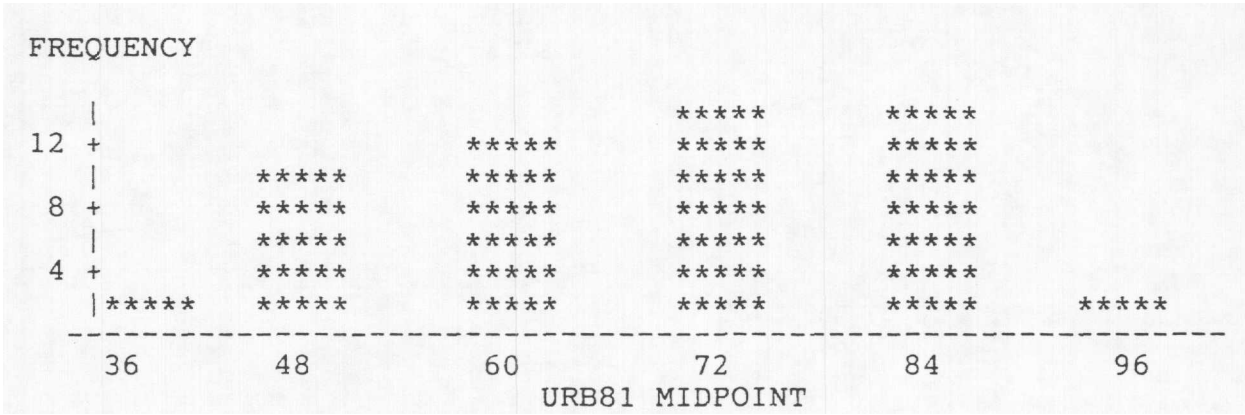


Figure A.4

Figure A.5

FREQUENCY OF URB81



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