

REDLINING: AN ECONOMIC ANALYSIS

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I.

INTRODUCTION

The role of redlining in the quality decline of housing units in urban neighborhoods has been the subject of heated debate in recent years. Various consumer and neighborhood organizations contend that, whether figuratively or literally, lending institutions draw red lines on maps around particular city neighborhoods and either refuse to grant mortgage credit or offer comparatively more stringent terms in the areas bounded by the lines. As evidence, they often cite statistics showing a lower volume of lending, often with a higher cost to borrowers, in particular urban compared to suburban neighborhoods. The antiredlining groups argue that such behavior by institutional lenders is at best overly risk averse and at worst discriminatory and arbitrary. They claim that redlining is a major cause of neighborhood decline since it denies the neighborhood the mortgage funds necessary to maintain stability of property values.

Many observers, however, argue that it is not necessary to construct a Devil Theory based on irrational behavior by lenders to explain the statistics cited by antiredliners. Instead, by examining rational lender response to economic conditions and regulatory constraints, these analysts seek to explain the relatively low supply of mortgage funds in certain neighborhoods. In part, this explanation stresses numerous borrower and neighborhood characteristics that increase the risk of lending beyond an acceptable level. In this view, low levels of mortgage activity in urban areas stem from general socioeconomic problems in those areas such as the flight of the middle class to the suburbs, low average incomes of city residents, aging of the housing stock, and inadequate inner city public services. It is also argued that usury ceilings often prevent lenders from charging a rate of interest sufficient to compensate for the high risk of mortgage lending in certain areas.

Coinciding with this debate has been a growing quantity of so-called antiredlining legislation, enacted at all levels of government. In California, state-licensed financial institutions are prohibited from denying a mortgage loan or adjusting the terms of a

loan on the basis of the age, location, or other "... conditions, characteristics or trends in the neighborhood or geographic area surrounding the housing accommodation unless the financial institution can demonstrate that such consideration in a particular case is required to avoid an unsafe and unsound business practice."¹

At the Federal level, the Community Reinvestment Act (CRA) encourages "regulated financial institutions to fulfill their . . . obligation to help meet the credit needs of their communities, including low and moderate income neighborhoods . . ."² The encouragement is that an institution's compliance with the CRA will be considered by its supervisory agency when it applies for an expansion of services.

Local governments have also enacted antiredlining legislation. A city law in Cleveland, Ohio empowers the city to withdraw its accounts from financial institutions that fail to make sufficient loans within the city. In particular, the law requires that the percentage of loans granted to city borrowers by a financial institution must equal the percentage of deposits held by city residents in that institution, or else the city may withdraw its funds [2].

Supporting these and other antiredlining actions are numerous empirical studies showing significant differences in the type, number, and terms of mortgages granted across neighborhoods. In particular, these studies have found that lending institutions located in certain urban neighborhoods, and obtaining a significant proportion of their deposits from urban residents, are directing the majority of their conventional mortgages to suburban properties. In some quarters, this is viewed as evidence that urban neighborhoods are not receiving their "fair share" of mortgage funds, which in turn, allegedly contributes to depressed property values and neighborhood deterioration. There are, however, major deficiencies in many of the studies upon which antiredlining actions are based. Generally, the studies simply present evidence of differences in the relative number and terms

¹ State of California, Health and Safety Code. Section 35810.

² 12 United States Code Annotated Sections 2901 et seq. (1977).

of conventional mortgages granted between urban and suburban properties and conclude that the cause is irrational redlining behavior by lenders. Totally ignored are any underlying economic causes for such differences in mortgage activity. The result may be to foster legislation that produces a costly misallocation of mortgage funds. Specifically, if there are rational economic reasons behind low levels of mortgage investment in certain areas, then legislation that requires or "encourages" institutions to lend to these areas may be counterproductive in the long run. The purpose of this article, therefore, is to determine the economic causes, if any, behind redlining behavior and to briefly evaluate the impact of antiredlining legislation on the mortgage market.

Before doing so, however, it is necessary to establish a working definition of redlining. As defined here redlining occurs when lenders base any element of the mortgage decision, including whether or not to lend and the terms of the loan, on the geographic location of the property or on the characteristics of surrounding properties. This narrow definition directs attention to one of the primary allegations of antiredliners, namely that geographic location is not a proper consideration in mortgage lending. Moreover, because of the existence of legislation that prohibits redlining as defined above [see 15], it is necessary to determine how geographic location and neighborhood characteristics affect the risk of a mortgage loan so that the economic impact of such legislation may be evaluated.

The remainder of this article contains five sections. Section II develops a simple model of the mortgage market that describes how mortgage funds are allocated among properties and borrowers possessing different risk characteristics. In Section III a number of market constraints that act to reduce the availability of relatively high risk mortgage loans are considered. Section IV reviews problems with FHA mortgage loans in urban areas, while racial discrimination in mortgage lending is addressed in Section V. Conclusions are presented in Section VI.

II.

A MODEL OF THE MORTGAGE MARKET ³

Demand For simplicity, suppose there are two households, one relatively poor and one relatively wealthy, that desire to obtain a mortgage loan to purchase a house in the same neighborhood. Assume

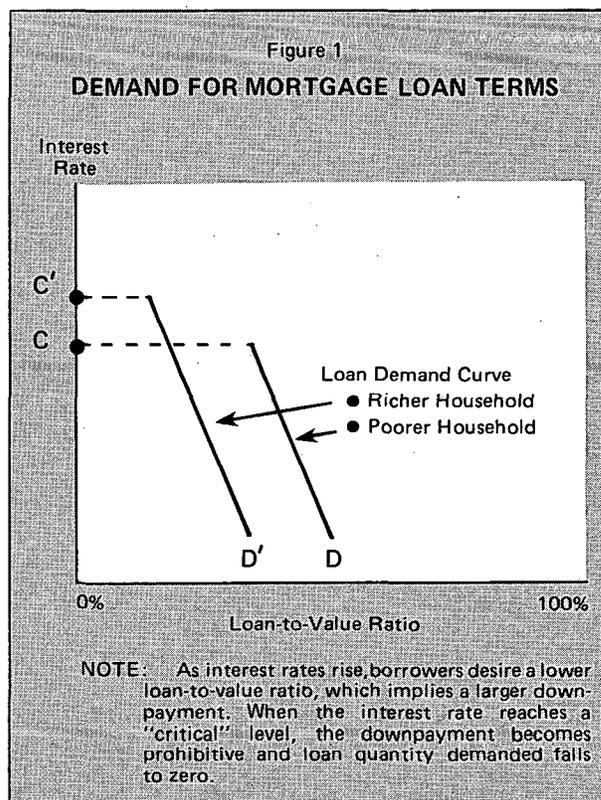
³ This section draws heavily on Glenn B. Canner's "Redlining and Mortgage Lending Practices" [6].

further that in this neighborhood all housing units possess identical economic characteristics such that the present market value, the expected future value, and the expected variance (change) in future values of each unit are the same. Thus, given the characteristics of the property, it is reasonable to expect that, for any given rate of interest, the poorer household will demand a larger loan (i.e., a smaller downpayment) with a longer term to maturity than will the richer household. The poorer household requires a larger loan because it possesses fewer cash assets to finance the downpayment. Similarly, it desires a longer term to maturity in order to reduce the monthly mortgage payment.

It is also assumed that a household's demand for mortgage loans varies inversely with the cost of borrowing, i.e., as interest rates rise both households will demand a relatively smaller loan. For a given property, a smaller loan of course implies a greater downpayment. Thus, the higher the cost of money, the less will be the loan-to-value ratio desired by borrowers.⁴

Figure 1, demand for mortgage loan terms, illustrates the loan-to-value ratio desired by the poor and

⁴ The loan-to-value ratio is the value of the loan divided by the market value of the property.



wealthy households, denoted by D and D', respectively, as interest rates vary.⁵ Note first that the loan demand D of the poorer household lies to the right of comparable loan demand D' of the richer household, indicating that for a given property, the poorer household desires a relatively greater loan than the richer household at every rate of interest. Next, note the horizontal dotted lines C and C'. These represent "critical" rates of interest for the poorer and richer households respectively, at which demand falls to zero. The idea behind the critical rate is simple. As interest rates rise, borrowers desire smaller loan-to-value ratios due to the increased cost of borrowing. This implies greater downpayments at higher rates of interest. Thus, once the interest rate reaches the critical level, prospective home buyers become either unwilling or unable to afford a greater downpayment and choose not to purchase the property. Quantity demanded therefore falls to zero.

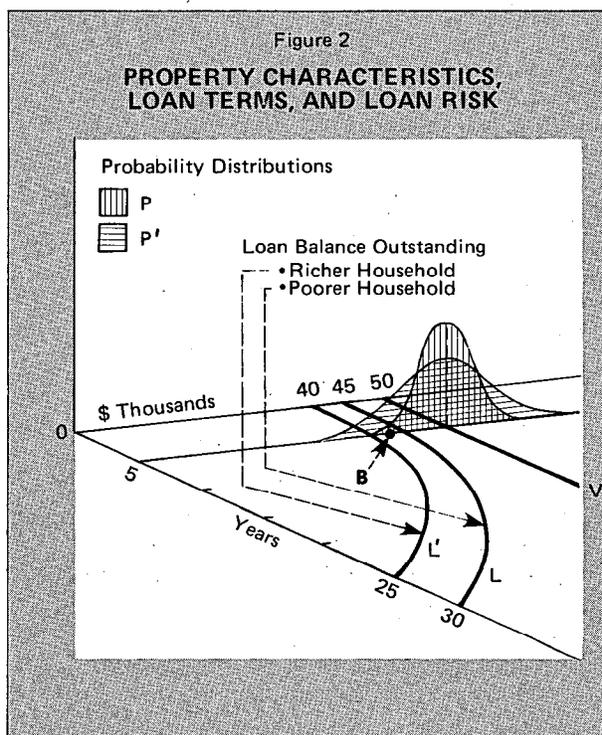
Supply To facilitate the analysis of mortgage loan supply, it is assumed that the market is purely competitive, that there are no government restrictions on lenders and that all information relevant to the lending decision is available to market participants at zero cost. It is also assumed that lenders are risk averse and therefore willing to accept additional risk only if compensated with higher rates of interest. The analysis of mortgage loan supply focuses on the relationship between the risk of default on a mortgage loan and (a) the terms of the loan, (b) the characteristics of the property, and (c) the characteristics of the borrower.

Holding the characteristics of the borrower constant, the risk of default on a mortgage loan and the cost to the lender in the event of default are closely related to the terms of the loan, the market value of the property at the time of sale, and future market values of the property over the life of the mortgage. The impact of these variables on risk and therefore on interest rates is illustrated in the following numerical example as well as in Figure 2.

Suppose that the market value of some property is \$50,000, and for simplicity, that the expected future value of the property remains constant at \$50,000 over time. This does not mean that the property's value will always be \$50,000, but rather, that its most

likely (i.e., expected) value at any time is \$50,000. There is of course some probability that its value will deviate from this amount. In Figure 2, the horizontal line V represents the expected value of the property over time and P and P' represent two possible probability distributions of the property's future value. These probability distributions depict the likelihood that the property's value will fall within some particular range. If P is the relevant distribution, for example, then there is, say, approximately a 70 percent chance that the property's value, at any time, will be between \$47,000 and \$53,000. If P' is the relevant distribution, then there is only a 50 percent chance that the property's value will fall within the \$47,000 to \$53,000 range. Thus the flatter or the more spread out the probability distribution, the more likely it is that the value of the property will deviate from its expected value of \$50,000. The term variance will hereafter be used to describe the relative flatness or spread of the probability distributions. The greater the variance of the distribution the greater the probability that the property's value will deviate from its expected value.

Now suppose two households, one relatively poor and one relatively wealthy, wish to purchase this \$50,000 property. The poor household desires a \$45,000 loan with a 30-year maturity and the wealthy household desires a \$40,000 loan with a 25-year maturity. In Figure 2, the downward-sloping bowed



⁵ In this analysis, the loan-to-value ratio is used rather than the dollar size of the loan so that the demand and supply curves are adjusted for differences in property value. Also, term to maturity of the loan is ignored throughout since it would greatly complicate the analysis and is relatively unimportant.

out curves represent the outstanding balance of each loan over time for the poor and wealthy households respectively. Notice that in both cases, the outstanding loan balance declines at an increasing rate. This is because for the first few years, most of the monthly mortgage payment goes to the interest charge, so that initially, the principal declines very slowly. Then, as the outstanding loan balance is reduced, the proportion of the mortgage payment that is applied to the interest charge is reduced, thereby increasing the proportion of the payment that is applied to the principal.

Having established this analytical framework, it is a simple task to show how loan terms and property characteristics influence the risk and cost of default. In Figure 2, notice that for each probability distribution P and P' the likelihood that the value of the property will at any time fall below the outstanding loan balance is greater for loan L than for loan L'. More generally, the greater the loan-to-value ratio and the longer the term to maturity of a mortgage loan, the greater is the chance that the property's market value may fall below the outstanding loan balance. And if the property's value does fall below the loan balance, the borrower has an economic incentive to default on the loan. For example, suppose that after five years the value of the property in Figure 2 falls to \$42,500 (point B) and for some reason the borrower with loan L has to relocate. He could either sell his property at its market value and prepay the mortgage or default on the loan. If he prepays the mortgage his loss will be \$7,500 (\$50,000 - \$42,500), whereas if he defaults his loss will be only \$6,000 (the \$5,000 downpayment + \$1,000 of repaid principal). Thus, he has an economic incentive to default on the loan. In effect, by defaulting he is selling the property to the lender at a price above its market value. Note that under the same circumstances, the borrower with loan L' has no incentive to default as the property's value at B is still greater than his outstanding loan balance. The upshot is that for a given property and borrower, lenders will charge a higher rate of interest the greater the loan and the longer its term to maturity in order to compensate for the increased risk of default. This implies an upward sloping loan supply curve such as S in Figure 3, where the interest rate is measured on the vertical axis and mortgage credit per dollar of property value (e.g., the loan-to-value ratio) is measured on the horizontal axis.

Differences in the expected variance of a property's future value also influence risk. Specifically, the greater the variance the greater the probability

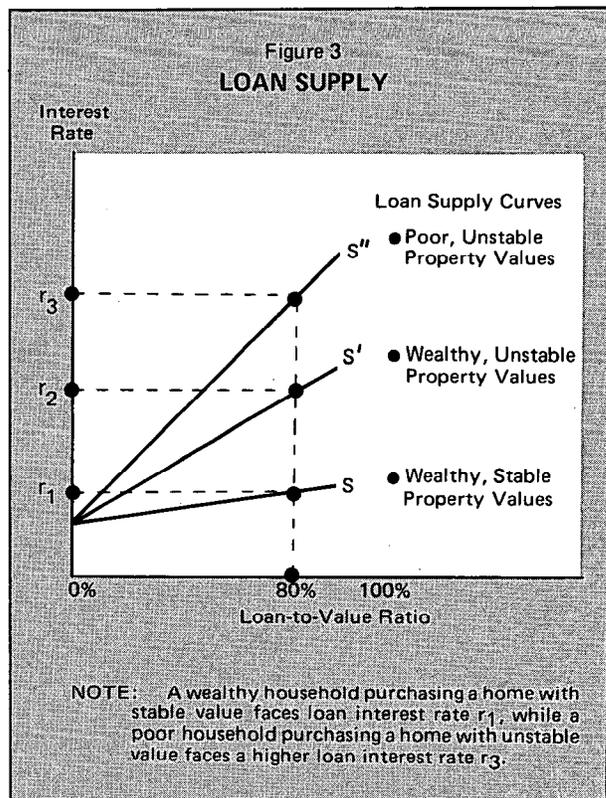
that a property's value may fall below the outstanding loan balance for any given loan terms. Thus, greater variances of property values imply a greater risk of default and thus a higher interest rate for any particular combination of loan terms.⁶ Higher variances therefore increase the slope of the supply schedule.

Differences in borrower characteristics, such as level and stability of income, will also alter the slope of the supply schedule. Borrowers with low incomes and/or whose job stability is closely related to the business cycle pose a higher risk of default due to inability to meet mortgage payments than do borrowers with relatively high incomes and secure occupations. Therefore, holding all else constant, lenders will require higher interest rates from households with low or highly variable incomes.⁷

Taken together, the above factors imply that for each combination of borrower and property characteristics there is a unique supply schedule repre-

⁶ It should be noted that lenders are only interested in the lower half of the probability distribution of the property's future value. That is, the probability that the property's value falls below its mean.

⁷ The value of the property being purchased relative to the borrower's income is an important determinant of default risk. Although ignored here by assuming all else constant, this factor is discussed in Section III.

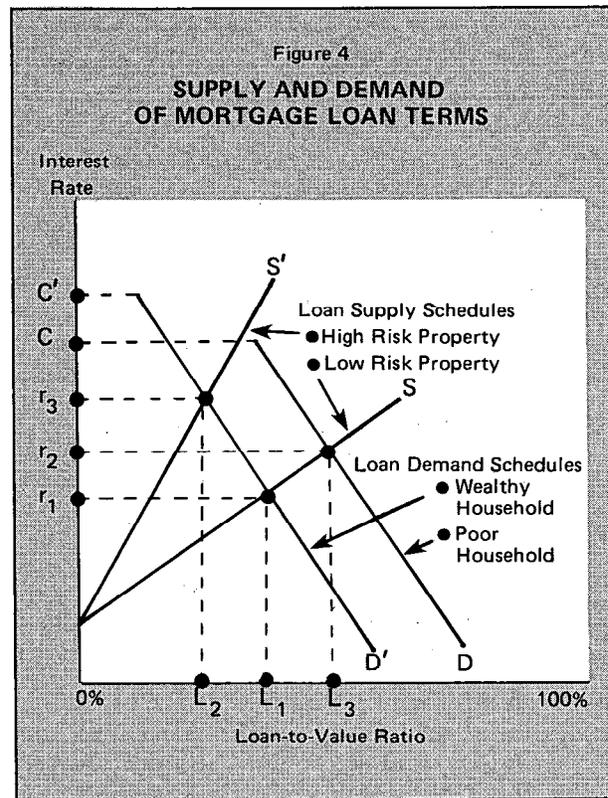


senting the loan terms available at each interest rate. In Figure 3, the loan supply schedule becomes steeper as (1) the expected variance in property value increases and (2) as borrower income declines (or becomes more variable).

Supply and Demand Figure 4 combines the loan demand schedules of a poor and a rich household with the supply schedules available for two properties, one with low risk S and one with high risk S' . To simplify the exposition, it is assumed that lenders ignore risk differentials between poor and wealthy households. Note that for the low risk property both households can obtain a loan. The richer household will get loan L_1 at an interest rate of r_1 while the poorer household will get loan L_2 at a rate of r_2 . Concerning the high risk property, note that although the richer household and the lender may reach mutually acceptable loan terms of L_3 at rate r_3 , there are no mutually acceptable loan terms at which the poorer household and the lender can agree for that property. That is, the poorer household will not obtain a loan for the high risk property because the household demands a greater loan-to-value ratio at every rate of interest than the lender is willing to supply. The same is true for all households with still lower wealth.

Now consider an urban neighborhood undergoing a change in residents where the upper and middle income households are moving to the suburbs and being replaced by relatively low income households. Because low income households require more liberal financing terms and also pose a higher risk of default, many of the new residents may be priced out of the mortgage market. That is, at every rate of interest the relatively poor households demand a greater loan-to-value ratio than lenders are willing to supply. Put differently, given the risks involved the lender will not make a loan on terms that prospective borrowers are willing to accept. This may be what has been occurring in urban neighborhoods during the past twenty years. Due to the migration of middle and upper income households to the suburbs, there has been a corresponding shift in central city population distributions from high and middle income households to low income households.

This demographic shift produces several effects. First, it causes the demand for owner-occupied housing units in the central city to decline and, given a fixed supply of housing units, acts to lower property values in the city relative to the suburbs. Second, since high income households are replaced with relatively low income households, the risk of lending to the new residents is greater. Thus by increasing risk,



these two factors cause a reduction in the supply of mortgage credit (e.g., an increase in the slope of the loan supply schedule) to city relative to suburban neighborhoods. Finally, since low income households desire relatively greater loan-to-value ratios than high income households at each rate of interest and cease borrowing altogether at lower critical rates, a relatively larger number of the new lower income residents may be priced out of the mortgage market.

The implication of this analysis is that neighborhoods characterized by declining property values and/or low resident incomes will receive relatively little mortgage financing. The mortgages that are granted will tend to embody relatively higher interest rates than mortgages made to higher income neighborhoods where property values are rising. The reason is not that lenders arbitrarily restrict credit to these areas. Rather, high risk levels produce a price of mortgage credit that is beyond the financial means of the borrowers. Thus, although certain neighborhoods may be redlined in the sense that mortgage terms and availability are unfavorable relative to those of other neighborhoods, this does not necessarily signify the existence of unreasonable lending practices.

Note, however, that while the above framework explains how rational economic behavior may lead to

differences in the number and terms of mortgage loans made across areas, it totally ignores government regulation and costly information, two constraints under which all lenders must operate. The next section describes how these factors act to reduce mortgage supply, especially to high risk borrowers and properties.

III.

MARKET CONSTRAINTS

Virtually all depository institutions in the United States are subject to extensive examinations by Federal and/or state regulatory agencies. One aspect of these examinations, portfolio regulation, consists of a review of the institution's loan portfolio and the classification of its loans into risk categories [14]. Generally, the categories are termed standard, substandard, doubtful, and loss. If too many loans fall into the last two categories, the regulator will conduct a detailed analysis in an attempt to establish the cause of the situation. Moreover,

... a formal letter is sent out to the bank's directors, asking for a detailed explanation of the portfolio problems. The institution's directors must respond by mail and promise to correct the situation. The regulator's letter is a form of moral suasion. Ultimately, the regulators may resort to more stringent measures. These measures include: publication of examination reports, the institution of proceedings designed to remove bank officers and directors that continue unsound or unsafe practices, the placement of the bank into receivership, the termination of insurance and the requirement that more funds be placed into the category, loss reserves.⁸

These sanctions act as a strong disincentive to making relatively risky mortgage loans, even if lenders are able to compensate for the risks with high interest rates. The reason is that portfolio regulation is more concerned with the number of "poor" loans than with the overall risk/return relationship of the portfolio. Thus, the net effect of portfolio regulation is to reduce the supply of institutional mortgage credit to high risk borrowers and areas.

One manifestation of portfolio regulation that is of particular importance to the redlining issue has been the development and widespread use of rules of thumb to estimate risk in mortgage lending. Although such rules would certainly exist in the absence of portfolio regulation due to high information costs, it is portfolio regulation which sets the standard of acceptable risk for the rules of thumb. For example, the most widely used rule is that the value of the

home being purchased should not exceed $2\frac{1}{2}$ times the borrower's gross annual income and that total monthly mortgage payments should not exceed 25 percent of the borrower's gross monthly income [11]. Thus, whereas loans in excess of these amounts would be available if there were no portfolio constraint, (albeit at a relatively high rate of interest), under the constraint such high risk loans are generally not available. The way in which these rules contribute to redlining is described below.

First, it should be emphasized that the above rule applies to an average size family with an average income. Low income families generally have to spend a greater proportion of their income on nonhousing related necessities (such as food, clothing, and transportation), leaving a relatively smaller proportion of their income to finance a mortgage. Thus, as income declines, lenders will reduce the amount they are willing to lend *per dollar of income*. The purpose is to reduce the risk associated with making loans to lower income households to a level comparable to that of an average income family falling within the rule of thumb.

Recall from the framework developed in Section II that low income families face a steeper loan supply schedule than high income families. Although low income groups are charged a higher rate of interest for a given loan, they are able to obtain a loan if they are willing to pay the necessary rate of interest. In contrast, the consequence of substituting risk reducing rules of thumb for higher interest rates is that lenders will automatically refuse a mortgage loan application if it possesses more risk than is generally acceptable. That is, the automatic price rationing of the market is replaced with rules-of-thumb rationing of lenders.

Figure 5 demonstrates this graphically in terms of the model developed in Section II. S represents the supply schedule for a loan of *average* risk where the borrower has an income of \$15,000 and the market value of the property is \$30,000. S' represents the supply schedule for a higher risk loan where the value and characteristics of the property are the same, but where the borrower has an income of only \$10,000. D is the demand schedule of the low income borrower. Notice that without any market constraints the borrower can obtain loan terms L_1 at an interest rate of r_1 . Recalling that the interest rate is in part a compensation for risk, a regulatory constraint that restricts the amount of risk may be viewed as a limit on interest rates. Therefore, if, because of portfolio regulation, lenders are unwilling to make any loans at interest rates above r_p (represented by the horizontal dotted line), then

⁸ Statement by Leo Labell, Chief Examiner of the Federal Reserve Bank of Boston, contained in "Redlining and Mortgage Lending Practices," pp. 152-153 [6].

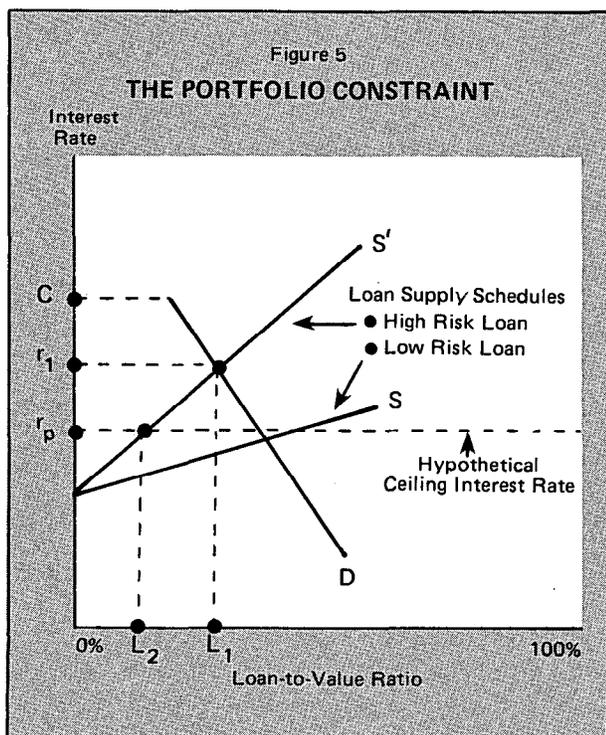
the borrower will be unable to obtain these terms. Lenders are willing to grant terms L_2 at an interest rate of r_p to the low income borrower, but he is either unwilling or unable to purchase the home on such restrictive terms. Using a rule of thumb, the lender may determine that in order for the low income borrower to face the average risk supply schedule, S , the value of the property being purchased should be no more than twice his annual income, or \$20,000. Thus, the borrower is unable to obtain conventional mortgage financing for any home valued at more than \$20,000. If perfect and costless information were available, the lender might find this particular low income borrower to be so frugal that even for the \$30,000 home he should face the average risk supply schedule. But since lenders do not have such information, they must base their actions on past experience which tells them that generally, low income borrowers are greater risks. Therefore, given the portfolio constraint and imperfect information, lenders will push the borrower onto the average risk supply schedule, S , by granting a loan only for property worth \$20,000 or less. Thus, in neighborhoods where home values are high relative to resident incomes, one would expect fairly low levels of conventional mortgage investment and relatively few owner-occupied units. And, since many redlining studies focus on conventional mortgage activity and the percentage of owner-occupied units, lenders in such areas

may be cited for not meeting the credit needs of their community. However, although lenders may be willing to make such high risk loans in low income neighborhoods (albeit at high rates of interest), they are unable to do so because of the portfolio constraint.

Rules of thumb may also be applied at the neighborhood level, in which case they are often dubbed "statistical discrimination." For example, if there is a significant difference in the average default rate for individuals in various educational, occupational, racial, or income groups, then the average risk of default in a neighborhood composed of a particular mix of individuals can be estimated. If the composition of neighborhood residents is such that lenders determine that the risk of lending to the area is too great, then conceivably, lenders may draw a red line around the neighborhood and refuse to make any mortgage loans within its boundary. This may occur if lenders believe that the cost of processing applications that will be denied exceeds the benefit from those few applications that are approved. A similar situation may arise if property values in the neighborhood are declining. Under these circumstances, even credit-worthy applicants may be denied mortgage credit.

Such drastic forms of redlining behavior, although rational from the individual lender's point of view, may not be socially optimal. This is an important point often raised by antiredlining groups. The argument is that when lenders, although acting independently, decide as a group that lending to a particular neighborhood is too risky, the result of their decision is a self-fulfilling prophecy. That is, as mortgage money becomes scarce in a certain geographic area, property values will decline more rapidly than otherwise as sellers are forced to compete for those few buyers who can obtain credit. And, as property values drop, the degree of risk and the severity of redlining in the neighborhood will increase. Although one lender granting mortgages in such an area is likely to lose his investment, participation of an entire group of lenders may not only stem the neighborhood's decline, but may also show a profit.⁹ In short, because of portfolio regulation and costly information, actions that are rational from the individual lender's point of view may prevent an outcome that is beneficial to all involved.

The last market constraint to be considered here, usury ceilings, are laws that place a limit on the interest rate that may be charged on residential mort-



⁹ Working on this premise, a number of cooperative ventures have been undertaken in various cities throughout the United States. For a summary of several such programs, see [1].

gage loans. The impact of usury ceilings on the mortgage market is, therefore, very similar to that of portfolio regulation. Recall that, by restricting risk in mortgage lending, portfolio regulation effectively limits the interest rate charge to some maximum. Similarly, by limiting the interest rate charge, usury ceilings restrict the risk that lenders may assume on mortgage loans to some maximum. Thus, both portfolio regulation and usury ceilings reduce the availability of relatively high risk mortgage credit.¹⁰ There is, however, a quantitative difference in the impact of these two constraints that depends upon (a) the general level of interest rates and (b) the difference in the maximum interest rate allowable under the portfolio and usury constraints.

The level of interest rates is important because usury ceilings limit the *nominal* rate of interest whereas portfolio regulation, in effect, limits the *real* rate of interest.¹¹ When interest rates are rising, as during periods of inflation, the implied portfolio constraint limit on interest rates will also rise so that lenders will be able to extend loans up to the same risk level as before the general interest rate rise. However, under the same circumstances, a *fixed* usury ceiling will force lenders to grant progressively safer and safer loans as mortgage interest rates approach the ceilings. Even when interest rates for average risk mortgage loans are well below usury ceilings, the ceiling may still restrict high risk mortgage credit if the interest rate necessary to compensate for the risks is above the ceiling. The respective impact of a usury ceiling and a portfolio constraint on the mortgage market will, therefore, depend critically upon where their interest rate limits are set in relation to each other and where they are set in relation to rates on mortgage and other long term investments.

There is, however, a method by which lenders may raise the effective interest rate on a mortgage loan above a fixed usury ceiling. This is done, where legal, by charging points or closing fees when the mortgage is made. A point is equal to one percent of the value of the mortgage loan, and, as a rule of thumb, lenders will charge two points for every one-quarter of a percent that the market rate is above the usury ceilings [10]. For example, if there is a 9

percent usury ceiling and market interest rates are 10.25 percent, then lenders will charge ten points. On a \$30,000 mortgage loan ten points requires a \$3,000 payment to the lender in addition to the regular downpayment. In effect, the lender is making a \$27,000 loan (\$30,000 — \$3,000) but receives monthly payments as if a \$30,000 loan had been made. The increase in the effective yield to the lender will therefore depend upon how soon the mortgage is repaid. If it is repaid in one year, then the yield on the mortgage is increased by approximately 11 percent (\$3,000, the value of the points, divided by \$27,000, the effective value of the loan). The greater the repayment period, the less will be the increase in effective yield.

The use of points to raise yields to market rates has important implications for the redlining issue. Although the effective interest rate may not be greater than the market rate if the repayment period is lengthy, the cash burden at the time of purchase is substantially increased by the use of points. In the previous example, if the downpayment were 10 percent on a \$33,000 home, then the cash burden at the time of purchase would be increased from \$3,300 (the regular downpayment) to \$6,300 (the downpayment plus the value of the points). Such increases in the effective downpayment resulting from usury ceilings are especially detrimental to low-income households inasmuch as they are more likely to be able to afford a slightly larger monthly payment resulting from a higher interest rate than a much greater downpayment resulting from the payment of points.

IV.

THE FHA IN URBAN NEIGHBORHOODS

A major issue in the redlining controversy is the predominance of government insured FHA mortgage loans in central city neighborhoods. Antiredlining organizations often criticize the FHA for allegedly contributing to the deterioration and abandonment of certain urban neighborhood properties. These criticisms are ironic inasmuch as amendments to the National Housing Act in 1968 directed the FHA to extend credit insurance to properties located in older declining urban areas with the goal of encouraging inner city homeownership and social stability. The difficulty the FHA has experienced in achieving these goals, however, is understandable given the characteristics of the FHA mortgage loans.

First, FHA mortgage loans are generally insured for 100 percent of the outstanding loan balance. That is, the FHA guarantees that the lender will

¹⁰ Figure 5, illustrating the effect of portfolio regulation, may also be used to illustrate the impact of usury ceilings. Rather than r_p representing the portfolio constraint on interest rates, let it represent the usury ceiling.

¹¹ The *nominal* interest rate is the rate actually charged by lenders, and is comprised of a compensation for the use of funds, plus a risk premium and an inflation premium. The *real* rate of interest is the nominal rate minus the inflation premium.

receive the entire outstanding loan balance in the event of default. This guarantee reduces the incentive to lend prudently. Without a financial stake in the property (i.e., without facing the prospect of a capital loss), the lender's primary concern is receipt of the monthly mortgage service payments. Thus, if the borrower falls behind in these payments, the lender has a strong incentive to foreclose on the property. An FHA mortgage may be contrasted with a conventional mortgage, where delayed payments are more likely to be tolerated and/or mortgage terms renegotiated in order to avoid the costs of foreclosing and a possible capital loss.

Second, FHA mortgage loans are all subject to FHA-imposed interest rate ceilings which are generally below market rates. This causes lenders to charge points (as in the case of usury ceilings), thereby raising the initial cost of the mortgage to the borrower.¹² Also, because points are collected at the time the mortgage is made, lenders realize a greater rate of return the sooner the loan is repaid. When this fact is combined with 100 percent FHA mortgage insurance, the result is a strong financial incentive not only to foreclose in the event of default, but also to make loans that are likely to default.¹³ For example, a profitable practice is for speculators to purchase relatively high risk, low price properties, make minor repairs, and then resell the properties at a higher price to low income households utilizing FHA mortgage loans. When the household defaults, often within just one year, the lender forecloses, recaptures the principal from the FHA, and keeps the points.¹⁴ The result is a neighborhood containing vacant, boarded up government-owned properties, which adversely affect the value of all homes in the area.

One proposal to improve FHA programs is to replace 100 percent insurance with a sliding scale where the insured portion of the mortgage increases with area and borrower risk, but is always less than 100 percent. By raising the lender's financial interest in the property, this could reduce the FHA foreclosure rate while continuing to encourage mortgage flows to relatively high risk areas. Similarly, elimi-

nation of point charges by eliminating interest ceilings would reduce the incentive to foreclose.

V.

RACIAL DISCRIMINATION AND MORTGAGE LENDING

In popular usage, the term redlining is often synonymous with racial discrimination in the mortgage market. This article, however, draws a distinction between the two. Redlining as here defined exists when lenders base any element of the mortgage decision (including whether or not to lend and the terms of the loan) on the geographic location of the property or on the characteristics of surrounding properties. Thus, racial discrimination may be viewed as a special type of redlining (hereafter referred to as racial redlining) where lenders consider the racial composition of the neighborhood surrounding the property in making their mortgage decision. This section examines the role of race in the mortgage market, and how this role effects mortgage availability.

In discussing the impact of race on the mortgage market, it is essential to distinguish two separate influences. The first is how the racial preferences of the population in general may effect neighborhood property values in racially mixed areas. The second is how racial discrimination by lenders affects the availability and cost of mortgage funds and how this in turn affects property values. The former will be examined first.

For a variety of social, historic, and economic reasons, most metropolitan areas in the United States are segregated into either predominately white or predominately black neighborhoods. Areas with a significant racial mix are often in transition from white to black. These transitional areas may experience relatively large fluctuations in property values if "panic" selling occurs as minorities enter the previously white neighborhood. In such neighborhoods, the increased variance in property values will cause lenders to decrease the supply of conventional mortgage credit to the neighborhood. As the neighborhood becomes predominantly black, however, property values should stabilize near their original level and lenders would have an incentive to increase mortgage supply to its original level. Thus, holding other characteristics of the residents constant, a U-shaped relationship between the percent minority in a neighborhood and the level of conventional mortgage activity is expected. This is illustrated in Figure 6, which depicts the level of

¹² Under FHA regulations, sellers must assume responsibility for payment of point charges. However, to the extent that sellers can pass on part of this cost in the form of a higher contract selling price, it is generally the borrower who bears this cost.

¹³ Since FHA insurance eliminates the risk of a capital loss to the lender, the portfolio regulation constraint does not apply.

¹⁴ Seventy-eight percent of foreclosed FHA loans on single family homes occur within 18 months [7].

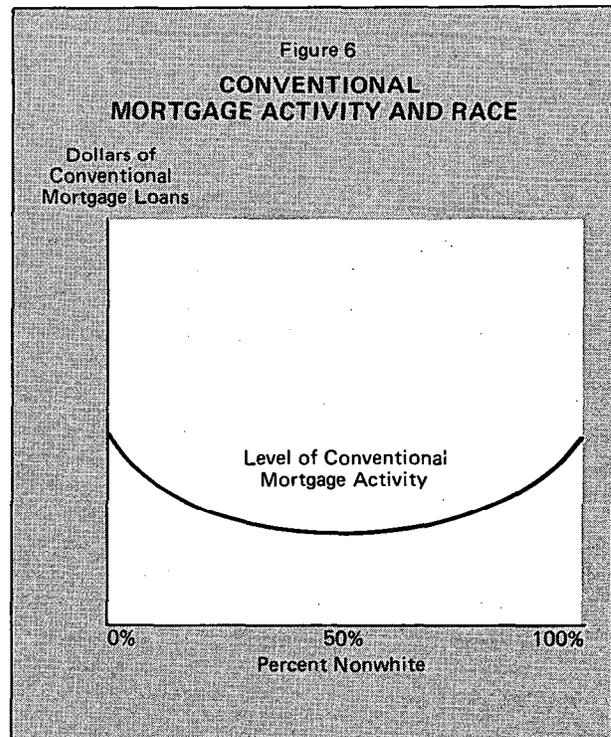
conventional mortgage activity first declining as a neighborhood changes from 100 percent white to 50 percent white, and then rising as the area becomes dominantly black.¹⁵ Nondiscriminatory behavior by lenders is implied by the curve since mortgage activity in the all white and all black neighborhoods are identical. Thus, in the case where lenders are reacting to an increased variance in property values, they are not discriminating by race, but rather are adjusting to market forces out of their control, e.g., the racial prejudices of the population.

It should be noted, however, that there is an important difference between lenders reacting to market forces, as described above, and lenders assuming before the fact that an influx of minorities will initiate property value fluctuations. The latter reaction is the case of racial discrimination which could be a cause and not a result of panic selling. For example, consider an all white neighborhood in which the majority of residents are free of prejudice, and which is experiencing a gradual inflow of minority households. If lenders use the racial composition of the neighborhood as a proxy for risk, then, as the neighborhood becomes integrated, lenders will reduce the supply of conventional mortgage credit to the area. Assuming that panic selling does not occur, i.e., that asking prices are the same as if the neighborhood were not becoming integrated, then a reduction in mortgage loan supply will force sellers to reduce their asking price thereby initiating property value declines. This occurs because reduced mortgage loan supply increases the required downpayment at every rate of interest, which in turn prices some prospective buyers out of the market at the original asking price. Thus, in order to sell, homeowners will be forced to reduce their asking price so that downpayment requirements are reduced. Nearby residents may then interpret the relatively low selling prices as a sign of panic selling on the part of their neighbors, creating an incentive for them to sell before property values decline further. Therefore, the adjustment of loan terms based on the racial composition of a neighborhood can initiate property value declines and contribute to eventual neighborhood deterioration.

Evidence suggests that the mortgage industry does indeed consider neighborhood racial composition in evaluating present and expected future changes in property values. For example, a widely used real estate appraisal text states that,

The value levels in a residential neighborhood are influenced more by the social characteristics of its

¹⁵ This U-shaped relationship was found in an empirical study of redlining in Toledo, Ohio [12].



present and prospective occupants than by any other factor. Hence, social data is a major consideration in residential appraising. No matter how attractive a particular neighborhood may be, it does not possess maximum desirability unless it is occupied by people who are reasonably congenial. This implies a community of interest based upon common social or cultural backgrounds.¹⁶

Social characteristics deemed instrumental in determining value include, "... age groupings, income levels, type of employment of head of household, *race and religion*, whether owner or renter, and amount of equity in owner occupied properties"¹⁷ (emphasis added). Moreover, actual and expected changes in social composition are viewed as significant.

... As a general rule, homogeneity of the population contributes to stability of real estate values. Information on the percentage of native born whites, foreign whites, and non-white population is important, and the changes in this composition has a significance. As a general rule, minority groups are found at the bottom of the socio-economic ladder, and problems associated with minority group segments of the population can hinder community growth.¹⁸

Such assumptions about the relationship between race and risk can create a self-fulfilling prophecy.

¹⁶ American Institute of Real Estate Appraisers, *The Appraisal of Real Estate* [4].

¹⁷ American Savings and Loan Institute, *Lending Practices and Principles* [5].

¹⁸ American Institute of Real Estate Appraisers, *Student Outline-Course-I-A-Real Estate Appraisal* [3].

If lenders assume that, holding all else constant, integrated or minority neighborhoods pose higher risks than all white neighborhoods, and therefore reduce mortgage loan supply, there will be downward pressure on property values.¹⁹ And since depressed property values increase risk, the prophecy of increased risk in integrated and minority neighborhoods is fulfilled.

SUMMARY AND CONCLUSIONS

Generally, differences in mortgage terms and availability across neighborhoods appear to result from differences in the risk related characteristics of neighborhoods and borrowers and from differences in the demand for mortgage loans between neighborhoods. Specifically, in areas where property values are declining or where resident incomes are low relative to property values the supply of mortgage funds will be less than in a more affluent area because of the higher risk of lending. The impact of lower supply in such areas is compounded by the greater loan-to-value ratios demanded by potential borrowers and their lower critical rate of interest.

The upshot is that since there are sound economic reasons behind so-called redlining behavior, legislation which assumes that geographic location is not a valid risk consideration and restricts its use may be counterproductive in the long run. For example, in California it is now illegal for state-licensed institutions to deny a mortgage loan or alter the terms of such a loan based upon the conditions, characteristics, or trends in the neighborhood surrounding the property.²⁰ Clearly, these are important risk related considerations. By severing the relationship between risk and rate of return, such regulations are likely to increase default rates and reduce the overall quality of mortgage loan portfolios of the affected institutions. This in turn may adversely affect profits, deposit rates, and the quality and quantity of other services provided by these institutions.

A better way to increase the availability of urban mortgage credit would be to eliminate usury ceilings and rigid portfolio regulations that reduce the availability of funds to high risk borrowers and areas. Also, a reevaluation of FHA loan policies and procedures is in order. The present system encourages unsound lending and costly foreclosures.

¹⁹ For a review of studies focusing on the relationship between race and property values see [9]. Of 17 studies reviewed, 6 found no relationship, 9 found a positive relationship, and 2 found a negative relationship.

²⁰ An institution may refuse a mortgage loan, or adjust the terms of the loan, if it can prove that failure to do so would result in an unsound business practice.

Perhaps the only case where there may be economically unjustified restrictions in mortgage loan supply is the case of racial redlining. This stems from the unfounded assumption that integrated and minority neighborhoods involve relatively greater risks. Therefore, to ensure equal housing opportunity, more vigorous enforcement of current anti-discrimination laws and a review of underwriting procedures which, in effect, may be discriminatory is desirable.

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TAXING CAPITAL GAINS

Roy H. Webb

This article draws from the author's paper in a forthcoming Federal Reserve System study of the Federal tax structure.

From the Boston Tea Party to Proposition 13, taxation has been a particularly contentious political issue in America. While there has been considerable debate on taxing income from capital, there remains substantial disagreement concerning the fairness and economic effects of specific taxes on capital income, especially taxes on capital gains.

Capital income in America is subject to very complex tax rules. As a result, an individual's capital income can be taxed at either much higher or much lower rates than are applied to his labor income. The capital gains tax occupies the extraordinary position of contributing both to relatively low tax rates on some capital income and relatively high rates on other capital income.

To establish a perspective for viewing capital gains taxation, we will first review the concepts of fairness, economic efficiency, capital, and capital income. Effects of capital gains taxes can then be examined in two steps. The first involves viewing the effects of capital gains taxes in an inflation-free economy. The second step is to add the complicating factor of inflation. At this point some perverse effects of capital gains taxes will be evident. Consequently, potential remedial changes to tax laws comprise the final topic.

PRELIMINARY DEFINITIONS

Not surprisingly, there is no universally accepted conception of fairness with which one can evaluate any particular tax. Perhaps the most widely accepted principle is horizontal equity, an economic corollary of the idea that any law should apply equally to all individuals. With respect to taxation, horizontal equity states that taxpayers in equal economic circumstances should face equal tax burdens. While it is a useful necessary condition, horizontal equity alone would not ensure a tax system's fairness. To do so would also require fair treatment of unequals, or vertical equity. Unfortunately, even the simpler goal of horizontal equity is not completely unambiguous. Moreover, achieving it would require sub-

stantial change in the current method of taxing capital gains. Thus horizontal equity by itself requires enough attention so that the more complex goal of vertical equity is not systematically addressed below, even though many different concepts of vertical equity repeatedly surface in tax analysis.

Besides equity, it is desirable that a tax have minimal adverse impact on the economy. Most taxes currently levied have some adverse consequences;¹ a desirable goal would be to collect a given amount of revenue with the least possible harm. Basically, levying a tax on one source of economic satisfaction induces people to shift their consumption toward untaxed sources. This distorted behavior leads to economic inefficiency, in that the tax distorts individuals' choices of what to consume and how to produce. As a result, they enjoy less than the maximum attainable economic satisfaction.

The sources of economic satisfaction can be divided into three categories: current consumption of goods and services, future consumption, and leisure. Each person must choose the fraction of time to spend in productive activity. Since productive activity yields income in exchange for leisure this is equivalent to choosing between (1) current and future consumption and (2) the amount of leisure. Postponing current consumption to the future, of course, is saving. While some saving merely takes the form of hoarding cash or commodities, savings can also be invested so that future production as well as future consumption possibilities are raised. Since investment involves formation of capital, the means of providing future production, the additional consumption potential from investing rather than hoarding can be regarded as capital income.

This potential does not normally remain constant. Relative price changes can alter capital asset values, thereby changing the asset owner's present and future consumption possibilities. Such asset revaluations are often referred to as capital gains and losses. Although some definitions of income exclude capital

¹ If a tax reduces (increases) production or consumption when a harmful (beneficial) externality is involved, then the tax can improve social welfare. Such taxes are not major contributors to Federal revenue, although some observers might put tobacco, alcohol, or gasoline excise taxes in this category.

gains, many economists prefer the definition given by J. R. Hicks, "A person's income is what he can consume during the week and still be as well off at the end of the week as he was at the beginning" (1946). Under this definition, which will be employed below, capital gains are clearly part of income.

The concept of capital is not limited to tangible capital, such as machines or structures. Individuals can also accumulate intangible capital by limiting present consumption in order to acquire knowledge, skills, and capabilities that will raise their future productivity. Examples of intangible capital include formal education, on-the-job training, research, and exploration for mineral deposits.

Investment is facilitated by financial intermediation, through which people with productive uses for capital indirectly acquire funds from others who have the desire and ability to substitute future for current consumption. There is an important distinction between real capital described above, and financial capital. The latter amounts to paper claims to real capital and/or real capital income embodied in bonds, common stock, vested pension benefits, insurance policies, and the like. An efficient system of financial intermediation directs funds to the most productive investments. Thus, the more efficient the system of intermediation, the more benefit accrues directly to savers and capital users, and indirectly to workers (whose marginal product is raised) and consumers (who see an increased supply of commodities).

TAXATION OF CAPITAL GAINS IN THE ABSENCE OF INFLATION

Equity and efficiency consequences of capital gains taxes can be divided between consequences unique to taxes on capital gains, and consequences resulting from any tax on capital income. Both are examined in this section. Some general consequences of any capital income tax are first examined. We then describe some important features of U. S. tax law and discuss some of their immediate impacts. The final task is to examine the distinct effects of taxes on capital gains.

Taxing Capital Income There is a clear qualitative effect on economic efficiency of taxing capital income: since capital formation is a means of providing future consumption, taxing capital income distorts individuals' choices away from future consumption toward leisure or current consumption. That such distortions could be significant is suggested by Lawrence Summers, who estimated, "the present value of the welfare gain from a shift (from capital

income taxation) to consumption or wage taxation is conservatively estimated at 5 years' GNP" (1978). Unfortunately, the current state of the art forces any estimates of relative welfare costs of different taxes to rely on heroic behavioral assumptions and numerous judgmental parameter estimates. Thus any particular study, including that of Summers, can at most be suggestive.

Another concern is whether capital income taxation is consistent with horizontal equity. Perhaps the most common view is that economic equals are persons who receive the same amount of income, regardless of its source. Under that view, horizontal equity would require a taxpayer to pay the same rate on capital and labor income.

This conventional reasoning has been challenged by Martin Feldstein (1978), who argues that horizontal equity requires capital income to be exempt from taxation. By interpreting economic equals as individuals with the same present value of lifetime consumption expenditure, he is able to show that taxing consumption would tax equals equally. He also notes that a proportional consumption tax is equivalent to a proportional tax on the present value of lifetime income. But such a tax is equivalent to an annual income tax only when the annual tax is proportional to its base, namely income before capital acquisition. Accordingly, since a tax on capital income violates this condition, Feldstein concludes that it is inconsistent with horizontal equity. Box 1 contains an illustration of this point.

While Feldstein's argument does cast doubt on the conventional horizontal equity assumption, his definition of economic equals can also be questioned. As the example makes clear, his definition of economic equality ignores valuable leisure. In addition, human capital complicates discussions of the equity of taxing capital income. An individual's level of labor income results from effort, human capital, rents to innate ability, luck, and other factors. Any tax on labor income consequently taxes the return to human capital. If other capital income were not taxed, new equity and efficiency problems would be created.

Some salient features of American tax laws are mentioned in Box 2 as a prelude to a discussion of the effects of the American method of taxing capital gains.²

Capital Gains Taxes and Economic Efficiency Adam Smith (1776) described the importance of a saver's investment choices:

² The primary source for this discussion is Bernard Greisman (1979).

Box 1

AN EXAMPLE OF A TAX ON CAPITAL INCOME THAT VIOLATES ONE VIEW OF HORIZONTAL EQUITY

Imagine a society whose residents have infinite lives (this unrealistic assumption keeps the arithmetic simple but does not affect any qualitative conclusions), in which the interest rate remains constant at 10 percent, and in which income from capital and labor is taxed at a 20 percent rate. Consider (1) an athlete who receives a salary of \$100,000, and (2) a laborer who receives \$10,000 every year. Because of declining ability the athlete will play only one year, investing his initial earnings and then living off income from capital, while the laborer intends to work and earn \$10,000 each year (for simplicity, assume that each receives his entire annual salary on January 1). Both the athlete and the laborer have identical present values of lifetime before-tax income, \$100,000 (the present value V of an infinite income stream I at interest rate r is $V = I/r$).

The athlete would pay a tax of \$20,000 on the one year's labor income. Thus he could save \$80,000, earning \$8,000 interest annually, and would pay a \$1,600 annual tax on the interest income. Therefore his interest taxes have a present value of \$16,000, and his combined lifetime taxes would have a present value of \$36,000. In contrast, the present value of the laborer's taxes would be \$20,000. It can be seen that only if capital income were not taxed would these Feldsteinian equals before tax have equal tax obligations.

This example also illustrates a weakness in Feldstein's argument. The athlete can enjoy a substantially greater amount of valuable leisure in his lifetime. Thus although equal by Feldstein's definition, the athlete has a greater before-tax access to sources of economic satisfaction (that is, both consumption and leisure) than the laborer.

Box 2

SOME RELEVANT TAX REGULATIONS

Capital gains are taxed when realized, not as accrued. This allows taxes to be postponed, thereby reducing the present value of tax payments. Also, a person with a tax rate which varies over time can choose to realize gains when the rate is abnormally low. If capital gains are not realized before a taxpayer's death, an estate tax is levied on the market value of the asset but no tax is assessed on accrued capital gains.

Gains from sales of assets held one year or less are taxed at the same rate as other capital income. If assets are held longer, 60 percent of the gain is excluded from the personal income tax. The maximum tax rate on taxable capital income is 70 percent, as opposed to a 50 percent maximum on taxable labor income. Due to the 60 percent exclusion, the maximum rate on long-term capital gains is 28 percent (ignoring for simplicity the "alternative minimum tax" which affects very few taxpayers).

Different assets are taxed at different effective rates. Capital gains in real estate can be postponed by "swap transactions," and owner-occupied homes provide even more ways to avoid capital gains taxes.

Also, income from capital owned by corporations is taxed at different rates from personal capital income. The existence of a corporate income tax in addition to the personal income tax is consistent with the traditional legal view of a corporation and its owners as separate entities. The resulting tax structure is relevant since ownership of corporate stock accounts for a significant fraction of taxable capital gains.

Corporate financial decisions can affect capital income taxes. Corporate capital income paid as interest reduces taxable corporate income; however, capital income used for dividends or retained earnings is taxed at the corporate level. Dividends are also taxed as personal income in the year re-

ceived, and retained earnings can provide capital gains that will eventually be realized and taxed. Consequently, income from real capital assets owned indirectly through corporations is taxed at a different rate from capital income from assets owned by a proprietor or by a partnership.

The existence of intangible capital further complicates matters. Business investments in intangible capital, for example research expenditures, receive more favorable tax treatment than corporate tangible capital investments, since intangible investment can often be counted as a current expense. Income from personal investment in human capital that increases marketable skills is taxed when labor income rises. But human capital that directly augments consumption possibilities (i.e., music lessons adding to enjoyment of symphony concerts) is not taxed.

Some capital owners are not required to pay personal taxes on capital income. Reserve funds of life insurance companies, pension funds, and charitable foundations are prominent examples of tax exempt institutions. Their tax exemption provides a strong incentive for individuals to own stock indirectly, i.e., by owning obligations of pension funds, rather than by personal ownership. Personal taxes on capital income can also be postponed if assets are placed into individual retirement plans, which some people are allowed to use to a limited extent.

Capital losses are not treated symmetrically with capital gains. The maximum loss deduction from ordinary income is \$3,000 per year; however, additional losses can be "carried over" for possible use in later years. The full amount of short-term losses, and 50 percent of long-term losses, are deductible to that extent. Also, 100 percent of capital losses can be deducted from capital gains realized in the same year.

Every individual is continually exerting himself to find out the most advantageous employment for whatever capital he can command. It is his own advantage, indeed, and not that of the society, which he has in view. But the study of his own advantage naturally, or rather necessarily, leads him to prefer that employment which is most advantageous to society. . . . As every individual, therefore, endeavours . . . to employ his capital . . . that its produce may be of greatest value; every individual necessarily labours to render the annual revenue of the society as great as he can. . . . [H]e is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention.

In short, Smith noted that a saver seeking his own maximum return helps maximize the social benefit yielded by valuable resources, the leisure and consumption foregone in order to produce capital.

This result can be changed by a particular tax system, however. Since the taxes described in Box 2 alter rates of return, the taxes can lead investors to substitute lightly taxed assets with low before-tax yields for more highly taxed assets with higher before-tax yields. Since the total return to all elements of society is represented by the before-tax yield, the social return to capital formation declines when such substitutions are made. The welfare loss from tax-induced capital misallocation was estimated by Patric Hendershott and Sheng-Cheng Hu to have been \$7.85 billion in 1976-77. Again, the amount of judgment necessary to make such estimates renders them suggestive rather than definitive.

The discussion above did not take account of an important feature affecting investment, namely that the return to an investment is not precisely known before the investment is made. The risk of low returns would affect investors even in a tax-free economy. The current tax system changes matters even more. When investment losses are possible, capital misallocation can result from the asymmetric treatment of gains and losses. Taking an example, suppose there are three equally likely results one year after investing \$1,000 in a new company: a gain of \$180, a gain of \$90, or a loss of \$90. If investors financed a large number of such companies, they would expect to gain, on average, $\$180 \times \frac{1}{3} + \$90 \times \frac{1}{3} + (-\$90) \times \frac{1}{3} = \60 , a 6 percent before-tax return. With symmetric treatment of gains and losses, an investor in the 50 percent bracket would expect to average \$30, a 3 percent return. But if the investor had previously exhausted his allowable loss deduction, (and expects to exhaust future deductions) he would average $.5 \times \$180 \times \frac{1}{3} + .5 \times \$90 \times \frac{1}{3} + (-\$90) \times \frac{1}{3} = \15 , a 1.5 percent return. Therefore, although on average, investors in new companies might receive higher yields than available from other investments, limited

deductibility of losses could direct savers toward less risky investments with lower social rates of return.

Suppose that full-loss offset, the ability to fully deduct any losses, were available. Would taxes then affect risk taking? James Tobin (1958) and many other writers have argued that, with full-loss offset, a proportional tax would actually increase personal risk taking. Defining risk as the variance of a security's return, Tobin noted that a proportional tax would lower both the risk and yield of each security. Making special assumptions concerning investor preferences and opportunities, Tobin was then able to prove his result. Feldstein (1969) pointed out the restrictiveness of the basic assumptions by Tobin et. al. Either by allowing more general (and intuitively appealing) investor preferences, or by removing the implausible assumption of the existence of a riskless asset, Feldstein was able to show that taxation could generate either greater or lesser amounts of risk taking, depending on unknown parameter values (such as those describing an individual's marginal utility of income). Thus he concluded that the effect of taxation on risk taking was an unanswered empirical question.

Feldstein (1976) conducted an empirical study, using 1962 data. Tax laws at that time were similar to, but not identical with, current laws. Rather than looking at the risk and ownership of particular investments, i.e., IBM stock versus General Motors stock, he studied six classes of financial assets: common and preferred stocks; taxable, municipal, and savings bonds; and bank accounts. At this broad level, he was able to conclude that although "The personal income tax has a very powerful effect on individuals' demands for portfolio assets . . . the portfolio variance of real pretax one-year rate of return is affected very little by the individual's tax situation."

There are many possible portfolio compositions with the same overall level of risk. Of particular interest are portfolios which contain small innovative companies, which are said to be especially dependent on non-dividend-paying equity capital. That dependence is assumed to be due to two factors. The first is a typical small company's cash flow, which can be high on average but subject to wide fluctuation, thereby raising the possibility of bankruptcy in a temporarily bad period if fixed charges are high. The second characteristic is a high rate of return on investment, making it desirable to reinvest capital income rather than pay interest and dividends. These factors have been used to argue for low capital gains

taxes relative to taxes on other forms of income. As one investor put it,

[Due to capital gains incentives] innovation has been encouraged and flourished, technological development has been accelerated, hundreds of thousands of new jobs have been created, the economy has been stimulated in a sound and meaningful manner, exports have been increased dramatically, our nation's standard of living has been improved, the forces of inflation have been resisted, and the national security of our nation has been enhanced.³

Most investors hold diversified portfolios; consequently, the risk of a financial asset is the changed risk of a portfolio with and without that asset. The widely used mean-variance capital asset pricing model explicitly defines this risk. For example, Copeland and Weston (1979) wrote, "[A]t the margin, the change in the contribution of asset i to portfolio risk is simply $COV(R_i, R_p)$." (COV stands for covariance, R_i is the return to owning asset i , and R_p is the return on the rest of the portfolio.) In many cases the earnings of a particular small company will depend on internal or local conditions to a much greater extent than on the general market environment. If so, the covariance between the return to owning that company's stock and the return on the rest of an investor's portfolio may well be small. Consequently, adding the company's stock would not add substantial risk to a diversified portfolio, even if that stock alone was very risky. Thus, it is not clear that investors need special tax breaks to induce them to hold risky individual stocks in diversified portfolios. Also considering Feldstein's empirical findings and the possibility that low taxes on capital gains could favor assets like gold bullion or unimproved land over investment in corporations through bonds or dividend-paying stock, the hypothesis that an optimal amount of corporate risk-taking requires capital gains taxes to be lower than other capital income taxes must be regarded as unproven.

If a capital asset appreciates substantially, the accumulated capital gains tax liability upon realization can deter the asset's sale. This is sometimes referred to as a lock-in effect, which is relevant both for individual investors and for projecting tax revenues under potential alterations of tax laws. Examining data for 1973, Feldstein, Joel Slemrod, and Shlomo Yitzhaki (1978) found evidence that the

amount of realized capital gains is sensitive to marginal tax rates. In fact, they argued that lowering capital gains taxes would actually increase tax revenue by increasing the turnover rate of corporate stock. A study of time series data by Slemrod and Feldstein (1978) also found strong empirical support for a lock-in effect. Finally, Yitzhaki (1979) examined the yield sacrificed by investors due to the lock-in effect. Using 1962 data he found that the lock-in effect lowered the annual return of high tax bracket investors by about $1\frac{1}{2}$ percent. As would be expected, the effect was weaker in low brackets. Unfortunately, no studies have sought lock-in effects for assets other than common stock.

Capital Gains Taxes and Horizontal Equity The current system of taxing capital gains violates horizontal equity in several respects. First, capital income received as realized capital gains is taxed at 40 percent of the rate for other forms of capital income. But for capital assets indirectly owned through corporations, a corporate income tax is collected on capital income before additional taxes are assessed on the person receiving capital gains (assuming a constant price-earnings ratio and positive marginal product of capital, retained earnings would necessarily raise the price of corporate stock). Thus, while the capital gains tax allows commodity or real estate holders to pay lower taxes on capital income than capital owners who receive interest or dividends, the case is less clear for recipients of capital gains on corporate stock. A final judgment would require knowledge of the incidence of the corporate income tax, an unresolved although much debated issue.

In addition, capital gains are not taxed until they are realized. Since the owner of an appreciating asset can often benefit without realizing a gain, capital gains recipients are favored over persons for whom accrued and realized incomes are equal. The latter class includes most recipients of labor income as well as persons earning interest or dividends. Box 3 contains an extreme example of the tax-reducing effect of taxing only realized gains. Moreover, taxing only upon realization especially benefits owners of large, well-diversified asset portfolios. At the same time that a portfolio as a whole can show a gain, individual assets may well incur losses. The owner can then sell enough assets to realize the portfolio gain by selling its losers along with some other assets. This adverse selection could conceivably reduce the owner's capital gains tax to zero.

This concludes the discussion of capital gains taxes in an economy without inflation. In several ways,

³ Reid W. Dennis, executive vice-president, National Venture Capital Association in Congressional testimony (1978). Statements such as this ignore the incentive that low capital gains taxes give to hold assets such as unimproved land or precious metals instead of assets which finance corporate capital purchase (such as bonds or dividend-paying stock).

Box 3**A TAX AVOIDANCE STRATEGY**

Suppose a corporation receives a marginal return r on its capital assets. If it pays this return to stockholders as dividends, a stockholder can keep his wealth constant and consume $(1 - \tau)rV_0$ after personal taxes, where τ is the personal income tax rate and V_0 is the stock's value (for future reference, this amount of consumption will be labeled C^d). The corporation can immediately lower its shareholders' taxes by reinvesting the income; assuming a constant price-earnings ratio, shareholders can receive their income as long-term capital gains which are taxed at 40 percent of the rate on dividend income. There is additional room for lowering taxes, however.

With the corporation reinvesting earnings, the stock value will appreciate at the continuously compounded rate r . In other words, at an instant of time t ,

$$V_t = V_0 e^{rt} \quad (1).$$

Suppose the shareholder can borrow at the market rate of interest which is assumed to be equal to the marginal product of capital, r . We will examine the strategy of having the shareholder borrow and consume an amount equal to accrued capital gains. While this strategy would keep his net worth (assets minus liabilities) intact, it avoids capital gains taxes while generating tax deductions for interest paid.

Letting L_t be the outstanding debt at time t , the assumption of constant net worth equal to V_0 can be written as

$$V_0 = V_t - L_t \quad (2).$$

The amount consumed at an instant of time, C_t^b , is equal to new borrowing, labeled \dot{L}_t , minus after-tax interest on outstanding debt $(1 - \tau)rL_t$, or

$$C_t^b = \dot{L}_t - (1 - \tau)rL_t \quad (3).$$

Now we can substitute the expression for V_t in (1) for V_t in (2) and rearrange terms, yielding

$$L_t = V_0(e^{rt} - 1) \quad (4).$$

Differentiating (4) we can obtain

$$\dot{L}_t = rV_0 e^{rt} \quad (5).$$

Substituting for L_t and \dot{L}_t in (3) and rearranging terms gives

$$C_t^b = \tau r V_0 e^{rt} + (1 - \tau)rV_0 \quad (6).$$

How does this compare with consumption from dividends, C^d ? Remembering that $C^d = (1 - \tau)rV_0$ for all t , we get

$$C^b - C^d = \tau r V_0 e^{rt} \quad (7).$$

In words, if a stockholder follows the strategy of (1) buying stock issued by a company which reinvests all earnings and (2) borrowing and consuming an amount equal to accrued capital gains, then he can consume more than if he bought stock which paid all earnings as dividends (in both cases keeping net worth constant). The additional consumption potential results from totally avoiding income tax by receiving income as unrealized capital gains. Moreover, the additional consumption increases with a taxpayer's marginal tax rate as well as the length of time the stock is held.

Although oversimplified in many places, this example illustrates how taxing only on realization can create strategies for tax avoidance, especially by taxpayers facing high marginal tax rates.

the current approach to taxing capital gains contributes to a system that can tax persons with the same before-tax income at different rates. Such a system is inconsistent with horizontal equity, and can also lead to capital misallocation. The next step is to add the complicating factor of inflation into the picture.

INFLATION, CAPITAL GAINS TAXES, AND POSSIBLE STRUCTURAL CHANGES

In the absence of taxes it is possible to imagine a neutral inflation with no relative price changes as all prices rise equiproportionally, including prices of capital goods. By definition such price increases are

not capital income, since capital owners' feasible consumption possibilities have not expanded. Such increases can be labeled inflation effects (as opposed to net capital revaluations which result from relative price changes and which do represent changes in capital owners' consumption possibilities). The sum of net capital revaluations and inflation effects can be designated gross capital revaluations.⁴ Tax regulations do not distinguish between gross and net

⁴In place of the terms "gross capital gains" and "net capital gains" some authors use "nominal capital gains" and "real capital gains," respectively. These terms would be confusing in this paper, however, due to our earlier distinction between real and financial capital.

gains, since taxable capital gains are defined as gross gains. Thus the tax rate on net capital revaluations increases with the rate of inflation.

Using tax returns from 1973, Feldstein and Slemrod (1978) examined the effect of inflation on capital gains taxes levied on common stock transactions. While they found aggregate gross capital gains reported at \$4.6 billion, adjusting for inflation converted the reported gain to a \$900 million net loss. According to their study, the tax burden was by no means uniform. Investors whose adjusted gross incomes were under \$100,000 showed a \$3.3 billion net loss, and also faced capital gains taxes of \$258 million. Higher income investors, however, had a net gain of \$2.4 billion, and a tax bill for \$880 million. The uneven distribution of the tax burden can also be seen another way. Of taxpayers who reported a \$2,000-\$5,000 gross capital gain, half had a net gain in the same range, one-third had a net gain between \$1,000 and \$2,000, and one-sixth had either a net loss, or a net gain less than \$1,000.

Interpreting their study is not a completely straightforward matter, however. The authors only had access to data on realized gains. Since owners of large portfolios can lower taxes by offsetting gains and losses, accrued income can be substantially higher than the realized income provided by data from tax returns.

In short, inflation can worsen horizontal equity violations by the capital gains tax. Investors who receive no net income may nevertheless face tax obligations. Moreover, investors in the same tax bracket with the same net gains will pay different taxes if the cumulative price level change differed over their holding periods.

Possible Structural Changes Even in a world without inflation, capital gains taxes are part of a tax system inconsistent with horizontal equity, a system that can misallocate the flow of investment funds. With inflation, capital gains taxes can increase capital income tax rates in a capricious manner. Such distortions are not inevitable, however. Changes could be made in the tax laws which would either eliminate or substantially lessen the worst distortions. One possibility is taxing an individual's entire capital income at the same rate, his labor income tax rate. Compared to the current situation, achieving that goal would improve capital allocation and horizontal equity simply by equalizing tax rates on capital income. No judgment is made on revenue effects of proposed changes; rather, an optimum level of tax rates is assumed.

A large number of changes are involved in achieving the goal of equal tax rates. Many are only loosely related to capital gains taxes and will not be considered here. Examples of such topics are taxing the income from assets such as owner-occupied housing and removing the inflation premium before taxation of interest income.

Many other changes are easily dealt with. Taxing net rather than gross capital revaluations could be accomplished by adjusting the purchase price of an asset in line with the rise in some price index. Other changes could actually simplify tax computation, including treating losses in the same manner as gains and removing the 60 percent capital gains exclusion. Finally, lowering the maximum tax rate on capital income to 50 percent (the maximum on labor income) would only involve changing a few tax tables. These changes move in the direction of taxing all income at the same rate.

Some effects of the particular changes mentioned in the preceding paragraph have been projected by Feldstein and Slemrod (1978). Applied to 1973 corporate stock transactions, the above changes would have reduced capital gains taxes by 28 percent.⁵ Potential tax reductions stemming from adjusting the purchase price for inflation, allowing full-loss offset, and lowering the maximum rate would have been partially offset by higher taxes from eliminating the capital gains exclusion. Taxpayers with adjusted gross incomes above \$100,000 would have faced a tax increase; however, those below \$100,000 would have received a substantial tax cut. For example, taxpayers in the \$10,000-\$20,000 income range had capital gains tax bills for \$23 million; the proposed changes would have given them a \$112 million tax credit. Conversely, investors with incomes above \$500,000, who actually had a \$374 million tax liability would have had a \$520 million tax bill with the proposed changes.

Such changes are unfortunately not sufficient to equalize capital income tax rates. Two major stumbling blocks remain: the deferral of capital gains taxes by assessing taxes only when gains are realized, and the corporate income tax.

Capital Gains Tax Deferral Although it was argued above that taxing only realized gains is inconsistent with horizontal equity, there are arguments in favor of taxing only realized gains. Taxing

⁵ The authors ignore the lock-in effect by only examining transactions which actually occurred. Also, as mentioned above, their reliance on realized rather than accrued income makes their results rather difficult to interpret.

accrued capital gains requires periodic valuation of capital assets. While actively traded assets such as corporate stock or precious metals are easily valued, values of other assets such as real estate or paintings can be only approximately estimated, often at considerable expense. Also, if an indivisible asset like a house appreciates, it might be difficult to acquire funds to pay taxes on accrued gains.

Despite these objections, some type of accrual taxation can be imagined. Asset owners could include end of year asset values on tax returns, which would also serve as the basis for the next year's return. For an asset not priced on a stock or commodity exchange, alternative values such as declared insurance valuations or local property tax assessments could be used to check the reasonableness of an owner's estimates. Spot checks and penalties for underestimates of price change might be used to deter against large underestimates. Unfortunately, compliance and enforcement costs could well be large. As to indivisibility, homeowners could arrange to include capital gains taxes in monthly payments, as is currently done with local property taxes. If only net gains were taxed, this would probably not be an insurmountable burden. Other indivisible assets, such as paintings, are presumably owned by persons who hold large diversified portfolios, so that divisible assets could be sold to pay taxes on appreciation of indivisible assets.

The Corporate Income Tax In order to tax capital incomes equally, there would have to be an integration of corporate and personal income taxes. Otherwise, investment undertaken by a corporation would not be taxed at the same rate as identical investment undertaken by a proprietor or by a partnership. However, there is no simple approach to integration without major drawbacks.

One approach to integration would eliminate the corporate income tax. Corporate capital income would still be taxed when received as interest or by shareholders as capital gains and dividends. A major drawback is that many owners of corporate stock—pension funds, certain foreign investors, etc.—do not pay personal income taxes. To the extent that they own corporate stock, capital income would not be taxed.

To remedy this defect, it has been proposed that the corporate income tax be treated as a withholding tax. Shareholders would periodically receive a statement giving their pro rata share of the corporate income tax paid. On a shareholder's personal tax return, this would either decrease his tax liability or increase his refund. However, special features in

the tax code such as the investment tax credit and employee stock ownership plans would quickly lose their appeal under this type of integration. A \$1 investment tax credit, for example, would lower corporate tax payments by \$1, but it would also lower shareholders' tax credits by \$1. Thus the net effect on taxes is zero. Consequently, this form of integration would negate the effects of many features that have acquired vocal constituencies.

The opposite approach would be to retain the tax on corporate income but to eliminate personal taxes on interest, dividends, and capital gains on corporate stock (to the extent that capital gains result from retained earnings). However, unless a shareholder's marginal personal tax rate happened to equal the corporate rate, capital income would still not be taxed at a rate equal to each taxpayer's personal rate. Thus this form of integration is most appropriate when there is a proportional personal tax system.

A variation on this theme would add an individual stockholder's share of taxable corporate profits to his taxable personal income while treating his share of the corporate income tax as personal tax withheld. Thus low income shareholders would receive refunds while high income shareholders would have to pay additional taxes. A drawback occurs to the extent that a corporation's ultimate tax payment differs from its first estimate, thereby causing intertemporal inequity among shareholders. Nevertheless, objections to this form of integration appear less persuasive than objections to either the current system or other methods of integration.

CONCLUSION

The capital gains tax plays a key role in a tax system which taxes different forms of capital income at widely varying rates. While this conclusion is true without regard to the price level, inflation results in taxes on spurious capital gains, thereby worsening an already questionable tax structure.

There are changes which could make tax rates on income from different sources more equal. The existence of such changes does not mean that immediate change is necessarily desirable, however.

Current capital asset values are based on the current tax structure. Unanticipated changes, including those mentioned above, would alter asset values and would injure many asset holders. To ameliorate such losses might require a lengthy phase-in period for tax changes.

That, in turn, leads to another cost of change. The changes discussed above might well substantially increase the burden of tax preparation and collection.

A gradual phase-in would further enlarge that burden.

Thus we conclude on an ambiguous note. While capital gains taxes are imperfect with respect to horizontal equity and economic efficiency, substantial

changes would be necessary to approach those goals. In light of our highly uncertain estimates of the magnitudes of costs and benefits of change, it is not surprising that an admittedly imperfect tax structure has endured for many years.

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