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ON THE EFFECTS OF INVESTMENT TAX CREDITS ON ECONOMIC EFFICIENCY AND GROWTH

(Should an Investment Tax Credit be Reintroduced?)

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ABSTRACT

In this paper, the reintroduction of Investment Tax Credits (ITC's) is analyzed in the context of a dynamic general equilibrium model of the U.S. economy. This model postulates forward looking investment decisions, and allows for endogenous government deficits and financial crowding-out. Also, it captures optimal labor-consumption and saving decisions.

Simulation results suggest that the reintroduction of ITC's would generate efficiency losses about .15 billion of 1973 dollars under the best scenarios. The efficiency losses confirm the conventional wisdom about the distortionary effects of ITC's. In turn, the global effects on investment demand and economic growth are negative. This challenges the conventional wisdom by emphasizing the importance of the marginal financial crowding-out effects associated to increased government deficits. Globally speaking, the reintroduction of ITC's does not appear to be a good idea.

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1. Introduction

The conventional wisdom on the economic effects of Investment Tax Credits as effective before the Tax Reform Act of 1986 is that while they generated distortions in the intersectorial allocation of capital, they simultaneouly constituted a powerful incentive to investment, and thereby to economic growth.

Before the Tax Reform Act of 1986, corporations were allowed to credit against their income tax payments a certain fraction of their investment expeditures. Even though the fraction allowed to be credited was uniform across sectors, different fractions applied to different types of investment goods. Therefore, differences in the composition of the capital stock across sectors induced different effective ITC rates across sectors. Accordingly, the ITC's were seen as a source of intersectorial distortions in the allocation of capital and as inducing sub-optimal investment in some sectors.

Despite the negative efficiency effects they generate, the ITC's have from its inception in the early 60's, found support among economists and policymakers as a powerful investment incentive. In fact, ITC's reduce the price of new capital goods by the fraction of the investment expenditures which can be credited against the corporate income tax payments, thereby promoting private investment and economic growth. This view was originally established by the seminal work of Hall-Jorgenson (1967). More recently this view is supported in Goulder and Summers (1983).

One of the important concerns in the design of the Tax Reform Act of 1986, was the elimination of some of the provisions in the taxation of corporate income perceived as generating economic distortions. A prominent such measure was the elimination of the Investment Tax Credit. Having been eliminated for their negative efficiency effects, the reintroduction of ITC's can be sought for their positive effects on economic growth. In fact, it seems plausible that in the near future, undesirable forces against economic growth will be unleashed. In the absence of any deficit reduction mechanisms, relatively high interest rates and the financial crowding out effects generated by large government deficits, may depress investment demand. On the other hand, potential deficit reduction mechanisms of the Gramm-Rudman-Hollings type may alleviate the upward pressure upon interest rates. However, they are also likely to induce a drastic reduction of government spending and/or increase in the tax rates, and thereby create further depressive effects in the economy.

If such a scenario is plausible so is the possibility of having the idea of reinstating an ITC thrown back into the political arena. Wouldn't an ITC be a good measure to counteract the potential regressive effects on investment and economic growth of the current tax law in the context of a high deficit economy?

The impact of the possible reintroduction of an ITC should be based on a careful account of its effects in terms of economic growth and economic efficiency. While the negative efficiency effects of ITC's can not be questioned on a priori grounds, the positive effects on investment demand and growth can be questioned. In fact, inasmuch as the new ITC's will induce lower corporate tax revenues, marginal financial crowding-out effects may be generated. If such a decrease in government revenue is financed by additional public borrowing, that will generate upward pressure on the interest rates. In turn, higher interest rates will increase the price of capital, and induce lower investment demand. On the other hand, marginal financial crowding-out may be avoided by confining our analysis to equal yield packages, say increasing the marginal personal income tax rates or corporate income tax rates simultaneously with the reintroduction of ITC's. In this case, additional distortions will be generated that should be accounted for. In both situations the net effects of ITC's on investment and economic growth are ambiguous.

Two important methodological implications follow. First, the evaluation of the potential overall effects requires a general equilibrium approach with emphasis on the dynamic aspects of economic behavior. Second, the consideration of the effects of the tax policy changes on government deficits is crucial. Previous research is based on a partial equilibrium analysis of the tax incentives focusing on the effects generated by lower prices of new investments - the case of Hall-Jorgenson (1967), or general equilibrium without consideration of government deficits - the case of Goulder-Summers (1987).

In this paper, the reintroduction of ITC's is analyzed in the context of a dynamic general equilibrium model of U.S. economy along the lines of Pereira (1988b,1988c). Such model postulates dynamic forward looking investment decisions. It allows for endogenous government deficits and for financial crowding-out. Also, it captures optimal labor-consumption and saving decisions.

The paper focuses on three intertwined points. First, it attempts to measure the negative efficiency effects of the ITC's. Second, it tries to determine the configuration of ITC that minimizes such negative efficiency effects. Finally, for this optimal configuration it analyzes the effects of ITC's on investment and economic growth. Simulation results suggest that the reintroduction of ITC's would generate efficiency losses of .15 billion of 1973 dollars under the best scenarios. The size of the net benefits depends on the particular policy design. In turn, the global effects on investment demand and economic growth are negative, which suggests that marginal financial crowding-out effects are dominant. Globally speaking, the reintroduction of Investment Tax Credits does not appear to be a good idea.

This paper is organized as follows. In section two, the model of the U.S. economy is briefly described. In section three, the policy experiments are discussed and the simulation results reported and analyzed. The final section offers a summary and some concluding remarks.

2. The DAGEM Model

This section provides a description of the dynamic general equilibrium model in this paper - DAGEM. The first subsection gives a general overview of the model. Given the specific nature of this paper, focusing on Investment Tax Credits, an in-depth description of producers' real and financial decision mechanisms is given in the second subsection. For a detailed description of the DAGEM model see Pereira (1988).

2.1 A General Overview

In the DAGEM model the U.S. economy is characterized by an incomplete, sequential market structure in a finite horizon and discrete time frame. All current markets are open, but there are no future markets. At any time, several markets are open for the different consumption goods, and for physical capital, labor and financial assets. In this economy there are three types of agents: consumer groups, industries, and government. Agents face a dynamic environment. Economic behavior of every agent in this economy is derived from an intertemporal specification of the agents' objectives and constraints.

The model consideres four industrial sectors: sector one includes agriculture mining and energy, sector two includes food, textiles, paper, chemicals, lumber and metals; sector three includes trade, finance, real estate and services, and sector four includes capital goods such as construction, transportation and machinery. Industries maximize the present value of the net cash flow in a technology with adjustment costs, to determine endogenously optimal supplies and optimal demands for the different production inputs. In particular, investment decisions are forward looking. Real investment is financed by retained earnings and issuance of new debt and equity according to exogenously defined rules.

Government engages in several economic activities. First, it collects taxes - on the use of labor by the different industries, on both corporate and personal income including capital gains, and on sales - according to an exogenously given tax regime. The taxation system in the model reflects the situation in the United States after the Tax Reform Act of 1986. Second, it transfers discretionary lump-sum amounts to the private sector. Finally, it purchases consumption goods and primary inputs to accomplish general government activities through the production of a public good. Government intertemporal behavior is obtained from the maximization of a social welfare function defined over the domain of the public good. General government activities are constrained by a recursive set of budget constraints so that government is allowed to run yearly deficits. Government engages in the sale of public bonds to finance such imbalances.

The model considers three income classes: lower class with yearly income below six thousand of 1973 dollars; middle class with income between six and fifteen thousand of 1973 dollars; and upper class with income above fifteen thousand of 1973 dollars. Optimal household behavior follows a life-cycle type of model generating endogenous savings and labor-leisure decisions. Household savings are invested in financial assets - public and private bonds, and equity. In the absence of uncertainty, the composition of the asset portfolio is a matter of indifference for the households. Portfolio decisions merely accommodate the composition of the demand for the funds households are supplying.

To make their real and financial decisions at each t, the economic agents use several types of information. They observe current prices at t. However, economic decisions are formulated in a context of imperfect information about future prices and interest rates. Intertemporal consistency is not imposed in the model. Agents are allowed to commit mistakes due to incorrect expectations. By generally assuming imperfect foresight, decisions will be taken that could have been improved upon, should the agents have accurately foreseen the future. Thus, plans about the future will, in general, be revised.

Atomistic competition in each and every market is assumed. Even though the number of agents on each side of the market is finite, it is assumed that enough agents are involved to render their actions negligible in terms of the overall equilibrium outcomes. The concept of Temporary Walrasian Equilibrium (TWE), is adopted to capture the incomplete and sequential aspects of real world trading, and the limitations of foresight into the future which we want to capture in this model. All current markets are assumed to clear, hence the Walrasian nature of equilibrium. Also, equilibrium in the short-run is parametric on the expectations of future prices held by the different agents as well as future taxation parameters, hence the temporary nature of equilibrium. The link between adjacent periods is endogenously provided by the recursive transitions of the stock variables in the economy.

The DAGEM model departs from most of the numerical GE literature for tax policy evaluation, in several fundamental directions directly relevant for policy oriented analysis (see Shoven-Whalley (1984) and Pereira-Shoven (1988c) for detailed surveys of this literature). First, it provides a comprehensive modeling of dynamic economic behavior. In particular, government deficits are optimally determined and investment decisions are forward looking and are the result of optimizing behavior. Secondly, it encompasses an endogenous sequential equilibrium structure founded on dynamic economic behavior with flexible expectations. Thirdly, the model provides a detailed consideration of financial assets, public and private.

Given the temporary equilibrium structure of the DAGEM, the computation of a t-dimensional intertemporal equilibrium path involves the computation of a sequence of t one-year equilibria parametrically on price expectations. The optimal transitions of the stock variables between adjacent one-year equilibria are determined endogenously given the equilibrium prices and net demands. For the simulation reported in this paper the DAGEM is run to produce a twenty-year equilibrium sequence in a decision time frame of one hundred years under myopic expectations. Also, short-run results refer to the first ten years and long-run to the whole twenty five year period.

2.2 Producers' Behavior

Production technology at each t is represented by a time-invariant Leontieff structure of the form:

(1) $y_{jt}=\mathrm{Min}\{F_j(L_{jt},K_{jt}),y_{j1t}/a_{j1},\ldots,y_{jJt}/a_{jJ}\}$.

The value-added production function, $VA_{jt}=F_j(L_{jt},K_{jt})$, is twice continuously differentiable, strictly increasing in every input, and concave.

We further assume that adjusting capital stock towards its optimal level is costly. This idea is captured by sector-specific cost functions "à la Gould" (1968), defined over gross capital stock accumulation. The adjustment cost functions can be interpreted to include both acquisition and internal, non-market adjustment costs. The twice continuously differentiable investment cost function for sector j is:

(2) $TC_j(I_{jt})=p_{It}[I_{jt}+C_j(I_{jt})]$,

The adjustment cost function has the following properties:

(3) $C_j(0)=0$, and $C_j(I_{jt})>0$ for $I_{jt}>0$,

(4) $\partial C_j(I_{jt})/\partial I_{jt}>0$ for $I_{jt}>0$,

(5) $\partial^2 C_j(I_{jt})/\partial I_{jt}^2>0$.

These assumptions on the adjustment cost functions are sufficient for existence and uniqueness of optimal intertemporal output plans even with constant returns to scale technologies. (On this issue see Pereira (1988a)).

The evolution of capital stock through time, reflecting actual investment, is given by the equation of motion:

(6) $I_{jt}=K_{jt+1}-(1-\emptyset_{jt})K_{jt}$

where $\emptyset_{jt}$ is the depreciation rate of capital stock installed in sector j at period t.

The equation of motion of capital reflects the idea that, in the short-run, capital stock is fixed, i.e., the capital stock in existence at t is not a decision variable at t, but it is determined by optimal decisions in previous periods. However, at t, investment decisions will be made determining the capital stock at t+1. In the long run, capital stock is variable.

Each sector of production j faces ad valorem taxes on the use of labor services, which represent the employer's portion of social security taxes. Therefore, if T_{Lt} is the tax rate, assumed constant across sectors of production, the cost for sector j of one unit of labor is given by $(1+T_{Lt})p_{Lt}$.

As a consequence of its decisions at period t, the sector realizes gross profits Π_{jt} – payment of capital services plus economic profits, i.e., sales revenues minus non-investment expenditures:

(7) $\Pi_{jt}=[p_{jt}-\Sigma_{1\leq f\leq J}(a_{jf}p_{ft})]y_{jt}-(1+T_{Lt})p_{Lt}L_{jt}$.

Each sector j is subject to an ad valorem corporate tax on Π_{jt}. The after-tax gross profits are $(1-T_{cjt})\Pi_{jt}$, where T_{cjt} is the sector-specific corporate tax rate at t.

On the other hand, investment expenditures benefit from an investment tax credit which is an ad valorem subsidy. Actual investment expenditures are $(1-ITC_{jt})p_{It}[I_{jt}+C_j(I_{jt})]$.

Interest payments are deductible from the corporate tax base so that the net interest paid on outstanding bonds is $(1-T_{cjt})r_tB_{jt}$.

Also, depreciation allowances DA_{jt} are to be deducted from the corporate tax base. Let $\emptyset'_{jt}$

and K'_{jt} be the depreciation rates for tax purposes and capital stock for tax purposes, respectively. The after-tax gross profits are increased by $T_{cjt}\emptyset'_{jt}K'_{jt}$.

Industry j's net cash flow at t NCF_{jt} can be written as:

(8) $NCF_{jt}=$

$$=(1-T_{cjt})\{[p_{jt}-\Sigma_f(a_{jf}p_{ft})]F_j(K_{jt},L_{jt})-(1+T_{Lt})p_{Lt}L_{jt}\}-(1-ITC_{jt})[p_{It}I_{jt}+C_j(I_{jt})].$$

The discounted value at t of the intertemporal sequence of net cash flows is obtained from the sequence of current and future expected market rates of return r_t's.

The producers' dynamic behavior with respect to real economic variables is determined by the maximization of the present value of net discounted cash flows at each moment z, subject to strictly convex adjustment costs, the equation of motion for the capital stock, and future price expectations. Formally, this is for $z\leq t\leq T$, $z\leq s\leq t$,

(9) $\mathrm{Max}_{\{y,L,I;K\}}\Sigma_t[\Pi_s(1+r_s)^{-1}]NCF_{jt}=\Sigma_t[\Pi_s(1+r_s)^{-1}].$

$$\{(1-T_{cjt})[[p_{jt}-\Sigma_f(a_{jf}p_{ft})]F_j(K_{jt},L_{jt})-(1+T_{Lt})p_{Lt}L_{jt}]-(1-ITC_{jt})[p_{It}I_{jt}+C_j(I_{jt})]\}$$

subject to:

i) <u>non-negativity constraints</u> for all $z\leq t\leq T$ and $1\leq f\leq J$,

(10) $y_{jft}\geq 0, L_{jt}\geq 0, K_{jt}\geq 0;$

ii) <u>equation of motion of capital stock</u> for all $z\leq t\leq T$

(11) $I_{jt}=K_{jt+1}-(1-\emptyset_{jt})K_{jt};$

iii) <u>state end conditions</u>

(12) $K_{jz}=K^*_j$

(13) scrap value of capital at $T+1$ is given.

Financing its real investment, production sector j is constrained in the following way for all $z \leq t \leq T$:

$$(14)\ F^{D}_{jt}=(1-ITC_{jt})p_{It}[I_{jt}+C_j(I_{jt})]+(1-T_{cjt})r_{Wt}B_{jt}+$$

$$(1-CGT_{jt})[p_{jEt}-p_{jEt-1}]E_{jt}-RE_{jt}-T_{cjt}\emptyset'_{jt}K'_{jt}$$

with terminal condition $FL_{jT+1}=0$.

This means that real investment activities and the payment of interest on outstanding debt at t are financed through retained earnings, RE_{jt}, and external funds, F_{jt}, which represent the increment in the financial liabilities of the sector FL_{jt}. Financial liabilities must be liquidated by the end of the model horizon.

Dividend-retention policies are exogenously given. Corporate dividend-retention policies are represented by parameter $\emptyset_{\Pi jt}$, the fraction of the after-tax gross profits generated at t which is retained by industry j. The remainder, $(1-\emptyset_{\Pi jt})$, represents the distributed portion of after-tax earnings. Total dividends at t, $(1-\emptyset_{\Pi jt})(1-T_{cjt})\Pi_{jt}$, are distributed among the t-th period shareholders. Notice that this criterion is consistent with the fact that the amount of capital in use at t by sector j is fixed so that gross profits reflect the existent capital stock and should be distributed among those who own it, the t-th period shareholders.

Corporate financing policies are exogenously given. External funds totalling F^{D}_{jt} are obtained by issuing additional equity and fixed price bonds:

$$(15)\ F^{D}_{jt}=\Delta B_{jt}+p_{Ejt}(E_{jt+1}-E_{jt}).$$

Issuance of new bonds and equity is governed by exogenous continuous corporate financing rules represented in this model by parameter $\emptyset_{Ejt}$. Such policy rules can be described as follows:

(16) $p_{Ejt}(E_{jt+1}-E_{jt})=\emptyset_{Ejt}F_{jt}$

(17) $\Delta B_{jt}=(1-\emptyset_{Ejt})F_{jt}$

with end conditions,

(18) $p_{jEz-1}E_{jz}=p^{*}_{jEz-1}E^{*}_{j}$ and $p_{jET}E_{jT+1}=0$

(19) $B_{jz}=B^{*}_{j}$ and $B_{jT+1}=0$.

Perfect capital markets are assumed such that the price of equity at z p_{Ejz} is the present discounted value of the future expected stream of dividends per share Div^{e}_{jt}/E_{jt}

(20) $p_{jEz}=\Sigma_t[\Pi_{s\leq t}(1+r_s)^{-1}]Div^{e}_{jt}/E^{e}_{jt}$, with $z+1\leq t\leq T$.

3. Simulation Design and Simulation Results

3.1 The Design of the Simulation Experiments

In the context of the DAGEM, policy evaluations are carried out by contrasting a base case reflecting the status quo and several counterfactual equilibria reflecting different policy scenarios. The information contained in the different equilibria is synthesized in a scalar efficiency indicator which is the dynamic generalization of the Hicksian Equivalent Variations. This efficiency indicator is designed to accommodate intertemporal comparisons of equilibrium paths when perfect foresight is not necessarily assumed and future markets are not open.

The link between the base case and the counterfactual simulations is provided by the concept of equal yield: to be comparable, base case and counterfactual equilibria should be such that the size of government is kept constant in a meaningful way. This is usually interpreted as government maintaining the same level of public utility in both the base case and the revised cases (see Shoven-Whalley (1977)). Given the presence of government deficits, the optimal level of expenditure necessary to achieve base case public utility can be financed by either changes in the tax revenues with constant base case deficits - tax-financed equal yield, or by changes in deficits with constant base case tax revenues - deficit financed equal yield, or still by a mix of deficits and tax revenues - mixed-financed equal yield. (See Pereira (1988d) for a detailed discussion on the concept of equal yield in the presence of government deficits).

The use of the concept of equal yield is important from the point of view of actual tax reform. First, most of the tax packages actually considered, postulate constant tax returns. This revenue neutrality is perceived as a proxy for constant deficits. Second, some measure of the marginal financial crowding-out effects induced by government deficits, can be inferred from the comparison of the several equal yield alternatives. Since tax-financed equal yield requires the same deficits in the base case and counterfactual equilibria, the differences between tax-financed and deficit-financed equilibria are generated by optimal changes in government deficits.

By concentrating on equal yield alternatives, our analysis requires the computation of replacement rates, i.e., the computation of the changes in some specific tax rates necessary to neutralize in some way the tax changes under consideration. Several replacement mechanisms are considered. Under corporate income tax replacement, the yield effects of introducing ITC's in compensated by increased marginal corporate income tax. Under personal income tax replacement, the compensation comes from increased marginal personal income tax. In both cases, the introduction of ITC's which is in itself distortionary, is accompanied by distortionary equal yield replacements.

In both cases, under corporate income tax replacement as well as under personal income tax replacement, the marginal tax rates may be changed according to either an additive or a multiplicative factor, cases which are denoted by additive and multiplicative replacement, respectively.

3.2 Simulation Results

The first set of experiments in this paper consist of the reintroduction under different scenarios a sector-specific Investment Tax Credit at the effective levels before the Tax Reform Act of 1986. The efficiency effects of reintroducing the ITC at pre-1986 levels as an isolated policy measure (and therefore without any equal yield considerations) are small but negative, -.03 billion of 1973 dollars in the short run and -.2 in the long run. These values are truly insignificant when compared to the intertemporal GNP or even the corporate tax revenues. This efficiency loss reflects the distortions in the relative prices of investment goods among incorporated sectors.

On the other hand, under the different equal yield alternatives, the size of the government in the economy is in some specific sense kept constant. The ITC is accompanied by some other 'yield offsetting' tax change. The efficiency effects are reported in Tables 1 for personal income tax replacement and Table 2 for the cases of corporate income tax replacements. In the case of personal income tax replacement, the efficiency effects vary from -.11 and -.24 billions of 1973 dollars in the short run, and between -.30 and -.595 in the long run. In the case of corporate income tax replacement the efficiency effects vary from -.045 and -.05 billions of 1973 dollars in the short run and between -.225 and -.25 in the long run. The most stricking feature of these results is that equal yield efficiency effects of reintroducing an *ITC* are for all the experiments, without exception, negative.

The efficiency effects are higher in absolute value under equal yield when compared to the pure reintroduction of ITC's. In fact, further distortions are being introduced by the equal yield mechanisms, in addition to the distortions in the relative prices of investment goods among incorporated sectors introduced by the ITC. Under corporate tax replacement, the wedge between the rates of return on capital in the corporate and non-corporate sectors is widened. Under personal income tax replacement, the distortions in the intertemporal labor-leisure decisions are increased.

Simulation results suggest that corporate tax replacements minimize the efficiency loss and are qualitatively comparable to the no replacement case. This is due to the fact that distortions in the rates of return on capital in the different industries induced by the ITC, are being directly offset by changes in the opposite direction on the corporate income tax rates. In turn, the personal income tax replacement exacerbates the efficiency losses by exacerbating the distortions in the intertemporal labor-leisure decisions.

Another interesting phenomena in all the experiments is the intertemporal pattern of losses. The average short-run losses are always lower than the average long-run losses. This is due to the presence of adjustment costs. It is costly and takes time for the capital stock in each sector to adjust to the optimal levels. Therefore, it takes time for the ineffiencies introduced by the ITC to show up.

The second set of experiments consists of introducing an ITC with effective rates that are uniform across sectors. The uniformity of the ITC rates is designed to minimize the distortionary effects on the allocation of capital induced by the reintroduction of an ITC. The objective of this set of experiments is to provide an answer to the following question. What is the uniform effective ITC rate that minimizes the efficiency effects of the ITC?

The results are presented in Table 3. Simulations suggest that efficiency losses are minimized for ITC rates around 3%. At this rate, the short-run losses are virtually neutralized and the long-run losses are about -.015 billion 1973 dollars.

The last set of experiments concentrates on the effects on investment and economic growth of reintroducing ITC's under the best scenarion of uniform rates at 3%. The results are shown in Table 4. Unlike the conventional wisdom, the simulatec net effect of reintroducing ITC's is a decrease in investment and economic growth. In fact, both investment and GNP are reduced by around .3%. This can be explained by the effects on government deficits of reintroducing ITC's. The reintroduction of ITC's is simulated to increase government deficits by about .65% in the short-run and .45% in the long-run. As a consequence interest rates increase. The after-tax interest rates which were reduced by the ITC's are simultaneously increased by the financial crowding-out effects generated by the increment in government deficits. The net effect is a .9% increase in interest rates in the short-run and about .8% in the long-run.

In summary, the simulation results in this paper confirm the conventional wisdom that ITC's are distortionary, but challenge the equally conventional wisdom that ITC's spur investment and growth. The global assessment is that ITC's should not be reintroduced, since they do not appear to be a solution to the problem they would conceivably be designed to attack - sluggish economic growth.

4. Conclusions and Final Remarks

In this paper, the reintroduction of ITC's is analyzed in the context of a dynamic general equilibrium model of U.S. economy along the lines of Pereira (1988b,1988c). Such model postulates dynamic forward looking investment decisions. It allows for endogenous government deficits and for financial crowding-out. Also, it captures optimal labor-consumption and saving decisions.

The paper focuses on three intertwined points. First, it attempts to measure the negative efficiency effects of the ITC's. Second, it tries to determine the configuration of ITC that minimizes such negative efficiency effects. Finally, for this optimal configuration it analyzes the effects of ITC's on investment and economic growth. Simulation results suggest that in the best scenario the reintroduction of ITC's would generate in the long-run efficiency losses of about .15 billion of 1973 dollars. The size of the net benefits depends on the particular policy design. In turn, the global effects on investment demand and economic growth are negative which suggests that the marginal financial crowding-out effects generated by increased government deficits are dominant. Globally speaking, the reintroduction of investment tax credit does not seem to be a good idea.

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Table 1.

EFFICIENCY EFFECTS OF ITC

Pre-1986 ITC Rates with Personal Income Tax Replacement

	Equivalent Variations (billions of 1973 dollars)	
	Short-run	Long-run
Tax-Financed E.Y		
Multiplicative	-.110	-.300
Additive	-.205	-.545
Deficit-Financed E.Y		
Multiplicative	-.130	-.330
Additive	-.240	-.595
Mixed-Financed E.Y		
Multiplicative	-.125	-.320
Additive	-.230	-.570

Table 2.

EFFICIENCY EFFECTS OF ITC

Pre-1986 ITC Rates with Corporate Income Tax Replacement

	Equivalent Variations (billions of 1973 dollars)	
	Short-run	**Long-run**
Deficit-Financed E.Y		
Multiplicative	-.050	-.230
Additive	-.045	-.250
Tax-Financed E.Y		
Multiplicative	-.045	-.225
Additive	-.045	-.245
Mixed-Financed E.Y		
Multiplicative	-.045	-.235
Additive	-.045	-.250

Table 3.

EFFICIENCY EFFECTS OF ITC

Under Different Uniform Rates w/o Equal Yield

	Equivalent Variations (billions of 1973 dollars)	
	Short-run	Long-run
Uniform Effective ITC Rates		
Pre-TRA 1986 levels	-.030	-.200
.01	-.035	-.255
.02	-.000	-.040
.03	-.000	-.015
.04	-.005	-.025
.05	-.005	-.035
.06	-.010	-.045
.07	-.010	-.500
.08	-.015	-.060
.09	-.015	-.065
.10	-.015	-.070

Table 4.

FURTHER EFFECTS OF ITC

For Uniform Effective ITC Rate at 3% w/o Equal Yield

	Deficits	Interest Rat.	Investment	GNP
	(counterfactual/base case values)			
Short-Run	1.00652	1.00909	.99710	.99733
Long-Run	1.00458	1.00827	.99671	.99742