

capital imports. It would be difficult to argue that the latest American economic boom, the high real interest rates, and the capital inflow induced by these had nothing to do with Reagan's keynesian policies.

Nevertheless, the growth dynamics, which can be seen from figure 2, and the extent of the American investment boom after 1982, shown in figure 7, are surprising. 1982 saw not only the start of the debt crisis, it was also a year of world wide economic recession. The increase in investment in the two years following this recession were, according to a study by Bosworth (1985), twice as large as in all previous boom phases; these all had a surprisingly stable pattern of acceleration of investment. There is a coincidence between capital imports and the rise in investment – it is more pronounced than that between the budget and current account deficits – and there is an even more striking coincidence between the maximum of the real interest rate and the peak of investment in 1984 (cf. Figures 4 and 7). None of these aspects fit well with the argument that the rise in interest rates and the capital inflow that followed this were caused by the tight monetary policy alone, nor do they fit with the argument that expansionary fiscal policy was the main culprit. According to both arguments, investment would have had to be reduced or at least the investment boom, which far exceeded that of earlier upswing phases, would not have been able to occur.

The incentive effect on investment of the tax reform of 1981 may provide an explanation for the fact that, up to 1984, there was an unusually strong investment boom despite the rise in real interest rates.⁷ A new method of tax depreciation – the Accelerated Cost Recovery System – was introduced in addition to the investment tax credit which was a subsidy of up to 10% of gross investment. Compared to the previous Asset Depreciation Range System, which was oriented towards the ideal of true economic depreciation, the

⁷Bosworth (1985) is rather sceptical of this argument but the following commentary by Summers makes it clear that Bosworth's estimate of the value of the incentive effect may be inappropriate.

new scheme meant that the average depreciation period was approximately halved, and, combined with the investment tax credit, the reform was equivalent to (in effect) an immediate write-off system for industrial plant and equipment. This aspect was later put forward as the official reason for the 1986 tax reform of the Reagan government (Department of the Treasury 1984, pp. 105-107) and has recently been documented again by Fullerton, Gilette, and Mackie (1987, p. 144) by means of exact calculations for individual categories of investment goods.

The effects of the Accelerated Cost Recovery System on international capital movements have been investigated by the present author elsewhere (Sinn 1984, 1985). On the basis of a model in which international capital movements come about by means of loans contracts and in which interest income is taxed on the residence principle, it was shown that changes in tax rates and depreciation allowances have very different effects on international capital movements. With true economic depreciation (following the Johansson-Samuelson definition) tax rate changes do not induce capital movements, because, from the point of view of the individual investor, domestic and foreign investments are equally affected. In an open economy they affect saving incentives but have no direct effect on investment. Accelerated depreciation allowances, on the other hand, are measures that selectively promote real domestic investment. In contrast to an overall fall in tax rates, these allowances raise the capitalized value of domestic investment projects for every given level of interest rates, thus stimulating the demand for investment goods and pushing up the level of domestic interest rates from the demand side. This leads to the exchange rate and current account effects, described in the last section, which make a real capital inflow possible. A long run, accumulated capital inflow in the order of magnitude of at least \$ 1000 b. was forecast (Sinn 1984). At the time this order of magnitude appeared excessive in view of the then current US current account deficit, but by the end of 1990 the value of US capital imports accumulated since the reform of 1981

will have reached approximately \$ 890 b., that is, almost 90% of the predicted level.

The effects of depreciation allowances are often underestimated in the literature, as they "only" cause a temporal shift of the tax burden and not a permanent tax saving. It is argued that depreciation allowances only have a stimulating effect on firms' investment decisions in the introduction phase, for tax relief only takes place then. At best, there will be a permanent tax relief effect in a growing economy, while in a stationary economy the incentive effect on private investment will soon disappear because the tax base will approach that under true economic depreciation. This view cannot stand up to a theoretical examination, for it overlooks the fact that an immanent rise in taxes, which would be brought about by a break in the stream of investment, creates a continuing investment incentive, even though the effect of accelerated depreciation can no longer be identified by looking at only the size of the current tax burden.⁸ In contrast to reductions in tax rates, depreciation allowances do not provide firms with permanent tax relief, but do nevertheless create strong and lasting investment incentives. They are a cheap means of stimulating capital formation, a means which the USA has made use of with good reason.

The immediate write-off system that the USA in effect had from 1981 to 1986 did not represent just a marginal change. Under this system, with corporate tax rates of 46%, American investment projects could carry a rate of interest twice as large as projects in countries where depreciation rules were oriented towards true economic depreciation. In other words, for a given number of investment projects, the capital demand curve in the US occurred at rates of interest twice as high as those in countries that had the same production technologies but did not have investment incentives like the Accelerated Cost Recovery System and the Investment Tax Credit. Looked at in this way, the predicted and actual capital inflow into the USA is no longer surprising.

Previous investigations of the relationship between American investment

⁸Cf. here the discussion between Neumann (1988) and Sinn (1988b) in the *Jahrbücher für Nationalökonomie und Statistik*.

allowances and the capital inflow have concentrated on capital movements between the USA and the other OECD countries (cf. Sinn 1984, 1985, 1987a, 1989b). As figure 5 shows, these movements were indeed very large. It is clear, however, that such investigations can be carried over analogously to the less developed countries. Compared to the capital movements that could have been expected to occur if American economic policy had been neutral, the less developed countries have also lost capital to the USA. As mentioned above, their capital imports fell annually from about \$ 90 b. in 1982 to practically zero in 1987, while US capital imports rose from zero to a good \$ 140 b. in the same period! The real problem of the debt crisis is tied up with the capital flow back to the USA. The debt moratoria and the other external characteristics of the crisis are simply the screeching tires of the capital transport vehicles that were forced to make a sudden sharp turn by the USA's policy.

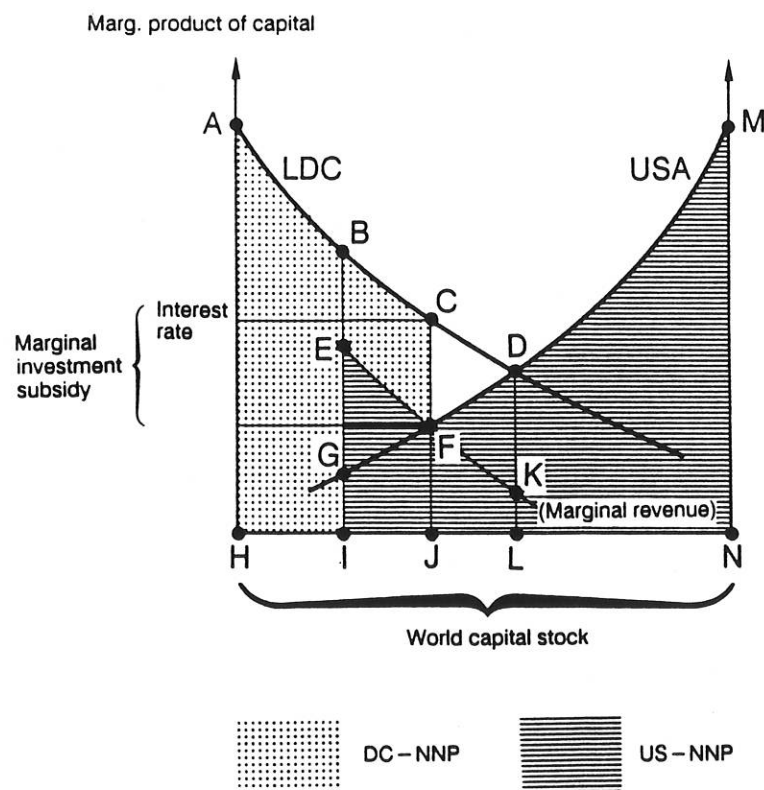
4. Cui Bono?

Who were the gainers and who the losers from the deflection of international capital flows towards the USA? The short term advantages for the USA are well-known. The American economy moved closer to full employment than the other OECD countries and its economic growth reached record heights. It is also clear that the less developed countries were adversely affected. The drying up of the capital inflow forced them to cut back their imports radically and they entered a phase of economic stagnation. There are, however, other long run welfare effects in addition to the obvious short run effects. These long run effects were to be expected as a result of the American policy of stimulating investment, or would have had to be expected if the US had not changed the direction of its tax policy again.

These welfare effects can be illustrated with the use of the Kemp-MacDougall diagram shown in figure 8. Assume a steady-state world economy with

a given total capital stock that is available for the USA and the less developed countries. With given technologies and given supplies of the other factors of production, each country has a specific marginal product of capital curve net of economic depreciation. In the diagram, the amount of capital used by the LDC's is measured from left to right and that of the USA from right to left. The thickly drawn lines are the regional specific (net) marginal product of capital curves. The combined capital stock of the two countries is equal to their combined wealth, but the amount of capital employed in one country is not necessarily equal to that country's wealth. It is assumed that the USA is rich in the sense that its wealth is larger than the amount of capital represented by the point of intersection of the two curves (LN) so that it would be a net lender in the case of an efficient distribution of the world capital stock. In the diagram, it is assumed that US wealth is given by IN and that of the LDC's by HI.

Figure 8: Optimal Investment Incentives from the Point of View of the Creditor Country



It is assumed that international capital movements take the form of bond trading and loan contracts, and that international interest income flows are taxed in accordance with the OECD Model Taxation Convention of 1977 (OECD 1977). The latter means that the residence principle is used and that small source taxes are allowed, but are credited in the country of residence. Under these conditions capital income taxation does not affect international portfolio investment even when the national tax rates are different. For the sake of simplicity, the analysis abstracts from differences between profit or corporate taxes on the one hand and personal income taxes on the other. This simplification ensures that the taxation systems do not discriminate between retained profits and loans as sources of finance and a specification of the firms' financing decisions can be omitted. International differences in tax rates are permitted.

Suppose, in the LDC's there are no tax investment incentives as there are in USA and the depreciation rules require true depreciation. Under these conditions, profit maximizing firms invest up to the level where the marginal product of capital is equal to the market rate of interest irrespective of the level of domestic taxes. Since this investment behavior is welfare optimal for each individual LDC which is too small to affect world interest rates by its own actions, it is assumed that public investment follows similar rules: official loans to developing countries are used to finance public projects up to the point where the last project's rate of return equals the market rate of interest. A violation of this rather heroic assumption would certainly have implications for a welfare theoretic assessment of the capital market equilibrium from the point of view of the world as a whole. However, as the following arguments concerning the assessment of this equilibrium from the point of view of the USA would not be affected, the assumption is an admissible simplification.

US firms, too, would extend their employment of capital up to the point where the marginal product of capital equals the interest rate, if tax depreciation

allowances followed the theoretical ideal of income taxation and there were no investment incentives in operation. In this case, world capital market equilibrium would be determined at point D where the two marginal product of capital curves intersect. The world interest rate would be DL, and the USA would lend an amount IL of its capital to the less developed countries.

From the point of view of all countries, this situation would be optimal because world output, the area under the two curves, would be smaller for every other distribution of capital. However, from the point of view of the USA in isolation, an optimum would be different. The USA is a large country which can influence world interest rates by its own actions and thus can gain from carrying out a monopolistic capital supply policy. The essence of such a policy would be to reduce the supply of capital on world markets and to lend less capital there under more favorable conditions.

In principle, the investment incentives introduced in 1981 are a suitable means for achieving this reduction. They induce American firms to invest at home beyond the point where the marginal product of capital equals the market rate of interest and thus drive the market interest rate upwards, reducing America's net capital supply to less developed countries. Incentives that maximize US national income or net national product are optimal for the USA. The allocation of capital that corresponds to this is shown by the Cournot point C in figure 8. Below this point – at F – the marginal product curve of the USA, which is also the marginal opportunity cost curve of capital lending, cuts the marginal revenue curve of capital lending EFK. The marginal revenue is the rise in net interest income earned in the LDC's when the capital supplied to them increases by one unit. Marginal revenue is below the market rate of interest because no price discrimination is possible and because the less developed countries impose source taxes. Without source taxes, the marginal revenue curve would go through point B. The gross interest, which the first unit of capital loaned receives, would be equal to its marginal revenue. With source

taxes, however, the first unit of capital must be content with a net-of-tax return below the market rate of interest.

In the optimum, US net national product is shown by the hatched area in the diagram. It consists of the US net domestic product FMNJ plus the net factor income earned in the less developed countries EFJI. The net national product of the LDC's is shown by the dotted area and is equal to the difference between net domestic product ACJH and net factor income EFJI paid to the US. Here the world market interest rate is CJ. It equals the marginal product of capital of the LDC's but exceeds the marginal product of capital of the USA by the amount of the marginal US investment benefit CF. The marginal investment benefit produces the gap between marginal cost and marginal revenue that signifies the monopoly solution.

If there were no investment incentives, that is, if the LDC's received loans of capital equal to IL, the net national product of these countries would be larger by the amount CDKF, and that of the USA smaller by FDK, than in the monopoly case. For both countries taken together, there would be a welfare gain of CDF compared to the monopoly situation, but the USA would be worse off.

On the other hand, if the marginal investment benefit had risen to BG, no capital at all would have been exported. Compared to the monopoly solution, the LDC's would have to forfeit an amount of national product equal to BCFE and the USA would lose the amount of EFG. No one would benefit from this. The best solution from the point of view of the USA is therefore achieved when it exports capital of amount IJ, and the best solution from the point of view of the world as a whole would be achieved with an export of capital of amount IL. So much for the model.

It is obvious that this model is, in many ways, not suitable for describing precisely the welfare effects of the international debt crisis. In particular, the negative real interest rates of the seventies make it difficult to identify the equilibrium solution D with

the world's historical situation before the debt crisis. The model could be suitable, however, for a welfare analysis that compares alternative scenarios for the development of the world economy. The end of the seventies represented a disequilibrium situation for the USA which it wanted to get out of by means of a restrictive monetary policy and large scale tax reforms. It had the choice between a neutral tax system that would have led to a world capital market equilibrium at D, or a non-neutral system by means of which American investment chances would effectively improve at the expense of the rest of the world. The latter system was chosen.

Whether the policy was quantitatively designed so that the optimal point C could be reached, or whether it was aimed at reaching it at all is an open question. There was certainly no conscious attempt to reach an optimum of the kind described above, for that American policy was far too internally directed. It is more likely that the American government was quite prepared to put up with the disadvantages to the rest of the world for the sake of giving its own economy a boost. The search for motives is a futile undertaking. Economic science does not attach much importance to the question of whether an economic actor optimizes consciously or not, and it would be quite wrong to pass a moral judgement on US policy. The analysis presented here makes no attempt to explain why the US decided to carry out a high interest rate policy, it is simply concerned with the welfare effects of that policy.

As far as the quantitative aspect is concerned, it seems that the American policy was too much of a good thing. After all, the officially estimated value of US net foreign wealth position (US assets abroad minus foreign assets in the US) had already become negative in 1984 and since then has fallen below minus \$ 660 b. in 1989 (see Survey of Current Business June 1990). Such a result can naturally not be an indication of an optimizing policy, for no monopolist would let the quantity supplied fall to zero, let alone become negative. Serious reservations are, however, appropriate insofar as the American

statistics may not be very accurate. They comprise the unadjusted historical cost value of capital investments and take no account of the increase in their value since the time of purchase. Since American investment overseas occurred earlier than foreign investment in the USA, the stock statistics must show Americans to be poorer than they really are (see also Amuzegar 1988 and Sinn 1987a, p. 230, n.38). This observation is confirmed by looking at the flow statistics for the net factor income Americans receive from overseas. The latter showed that, until 1988, not even the sign for the American wealth position could have been correct. In 1988, the US was reported to have a net foreign wealth position of \$ - 531 b., but the net investment income received by the US was \$ + 1.6 b. (see Survey of Current Business, June 1990, Tab. 2). It was not until 1989 that this net income eventually turned negative. Only now (1990) can there be little doubt that the US is a debtor country.

So it seems that the United States overdid its policy. A more moderate policy of investment incentives might have helped the US to increase its national advantage from lending capital abroad, but the policy actually chosen was by far too strong to produce this result.

5. Concluding Remarks and Future Prospects

The US economic policy at the start of the 1980's was a gigantic experiment which caused all kinds of disruption to the world and which was observed with incredulous astonishment by many non-US economists. The combined effects of a very restrictive monetary policy, an exceptionally expansionary budget policy and a massive investment incentive scheme led to a truly explosive increase in American real interest rates. This in turn drove the dollar to unanticipated heights and, by way of a current account deficit, induced a huge inflow of capital into the US. The less developed countries were faced with a sudden, unexpected change in the conditions of their loans contracts. In the sixties, they had been, in effect, rewarded in the form of negative real interest rates, for their helpfulness in

looking after the capital loaned to them, now they were suddenly faced with the demand that they actually service their debts. In some countries, the immediate reaction to the changed conditions was a refusal to pay – this was the outward sign that a debt crisis was occurring. However, the circumstance that the high interest rates forced the less developed countries to abruptly limit their credit intake was probably even more important. This limitation resulted in a stagnation phase which increased the debt ratio instead of reducing it. As a result of American policy the driving forces of economic growth were shifted away from the less developed countries and the rest of the world to the USA.

This result could have been in the American interest, not only from a short run point of view, but also in terms of long run investment strategies, had the policy been of a more moderate design. The United States, as the formerly largest capital exporter, could have manoeuvred itself into a position where it could have lent somewhat less capital to developing countries under more favorable conditions than previously. However, the policy was too strong to achieve this result. The US capital import was truly excessive.

Since then, in the light of the magnitude of the reaction to its policy, the US has become nervous about its own daring. The tax reform introduced in 1986 cancelled many aspects of the 1981 reform⁹. In particular, the investment incentives brought in in 1981 were largely set aside. The fall in the dollar from 1985 can be seen as a reaction to the new tax reform which had already been announced in 1984.¹⁰ It is suggested that this fall will lead to a long term improvement in the American current account balance and thus to a drying up of capital imports into the USA. The experiment would then be at an end, and this would justify a hope for a renewed phase of growth in the less developed countries and elsewhere in the world with moderate interest rates and loans contracts that can actually be fulfilled by less developed countries. The new American tax system is largely free of

⁹See Sinn (1989b).

¹⁰See fn. 5.

"bribes" for capital, as Samuelson (1964) once called depreciation allowances. Capital can again flow freely to those countries where it can most usefully be employed. It is to be hoped that the presently less developed countries will be among them.

References

- Amuzegar, J. (1988), The US External Debt in Perspective. *Finance and Development*, June, 1988, pp. 18-19.
- Bosworth, B.P. (1985), Taxes and Investment Recovery. *Brookings Papers on Economic Activity* pp. 1-38.
- Cohen, D. and Sachs, J. (1986), Growth and External Debt under Risk of Debt Repudiation, *European Economic Review* 30, pp. 529-560.
- Department of the Treasury (1984), Tax Reforms for Fairness, Simplicity and Economic Growth, Washington 1984: US Government Printing Office.
- Eaton, J. and Gersovitz, M. (1981), Debt with Potential Repudiation: Theoretical and Empirical Analysis, *Review of Economic Studies* 48, pp. 289-309.
- Eaton, J., Gersovitz, M., and Stiglitz, J.E. (1986), The Pure Theory of Country Risk, *European Economic Review* 30, pp. 481-513.
- Emminger, O. (1988), Die internationale Schuldenkrise und die Banken. In: P. Bernholz, K.E. Born u.a. (eds.), *Die internationale Schuldenkrise*. Berlin 1988: Duncker & Humblot.
- Feldstein, M. (1988), Feldstein on the Dollar, *Economist*, 3/1988, pp. 21-23.
- Fullerton, D., Gilette, R. und Mackie, J. (1987), Investment Allocation and Growth Under the Tax Reform Act of 1986. In: Office of Tax Analysis (ed.), *Compendium of Tax Research 1987*. Washington 1987: US Government Printing Office.
- Hardy, Ch. S. (1979), Commercial Bank Lending to Developing Countries: Supply Constraints. *World Development* 7, pp. 189-197.
- Joint Committee on Taxation (1981), Summary of H.R. 4242. The Economic Recovery Tax Act of 1981, Washington 1981: U.S. Government Printing Office.
- Niehans, J. (1986), Internationale Kredite mit undurchsetzbaren Forderungen. In: P. Bernholz, K.E. Born u.a. (eds.), *Die internationale Schuldenkrise*. Berlin 1986: Duncker & Humblot.
- Neumann, M. (1988), Beschleunigte steuerliche Abschreibungen und Kapitalertrag nach Steuern in einem langfristigen Wachstumsgleichgewicht. *Jahrbücher für Nationalökonomie und Statistik* 204, pp. 342-345.
- OECD (1987), Model Double Taxation Convention on Income and on Capital. Report of the OECD Committee on Fiscal Affairs. Paris 1977: OECD.
- (1987), Financing and External Debt of Developing Countries. 1986 Survey. Paris 1987: OECD.

- Samuelson, P. (1964), Tax Deductibility to Ensure Invariant Valuations. *Journal of Political Economy* 72, pp. 604-606.
- Sinn, H.-W. (1984), Die Bedeutung des Accelerated Cost Recovery Systems für den internationalen Kapitalverkehr. *Kyklos* 37, pp. 542-576.
- , (1985), Why Taxes Matter: Reagan's Accelerated Cost Recovery System and the US Trade Deficit. *Economic Policy* 1, pp. 240-250. Reprint forthcoming in: E.S. Phelps (ed.), *Recent Developments in Macroeconomics*. Cheltenham 1985: Edward Elgar Publ. Ltd.
- , (1987a), Capital Income Taxation and Resource Allocation. Amsterdam, New York etc. 1987: North-Holland Publishing Company.
- , (1987b): Der Dollar, die Weltwirtschaft und die Amerikanische Steuerreform von 1986. *Hamburger Jahrbuch für Wirtschafts- und Gesellschaftspolitik* 32, pp. 9-23.
- , (1988a), U.S. Tax Reform 1981 and 1986. Impact on International Capital Markets and Capital Flows. *National Tax Journal* 41, pp. 327-340. (Background paper prepared for World Development Report 1988).
- , (1988b), Beschleunigte steuerliche Abschreibungen: Verpuffende Anreize? *Jahrbücher für Nationalökonomie und Statistik* 205, pp. 457-462.
- , (1989a), Die Amerikanische Wirtschaftspolitik und die Weltschuldenkrise, In: G. Bombach, B. Gahlen and A.E. Ott (eds.), *Die nationale und die internationale Schuldenproblematik*. Tübingen 1989: J.C.B. Mohr (Paul Siebeck).
- , (1989b), The Policy of Tax-Cut-cum-Base-Broadening. In: M. Neumann and K. Roskamp (eds.), *Public Finance and Performance of Enterprises*, Detroit 1989: Wayne State University Press.
- Tanzi, V. (1989), Fiscal Policy and Economic Reconstruction in Latin America. IMF Working paper 89/94.
- Wallich, H.C. (1986), The International Debt Situation in an American View: Borrowing Countries and Lending Banks. In: P. Bernholz, K.E. Born u.a. (eds.), *Die internationale Schuldenkrise*. Berlin 1988: Duncker & Humblot.

Statistical Periodicals

Annual Report, International Monetary Fund, Executive Directors, Washington D.C.

Business Conditions Digest, U.S. Department of Commerce, Bureau of Economic Analysis,
Washington, D.C.: U.S. Government Printing Office.

Historical Statistics, OECD, Economic Outlook, Paris.

Main Economic Indicators, OECD, Department of Economics and Statistics, Paris.

Survey of Current Business, U.S. Department of Commerce, Bureau of Economic Analysis,
Washington, D.C.: U.S. Government Printing Office.

World Debt Tables, World Bank, Washington D.C.

World Development Report, World Bank, New York, Oxford etc.: Oxford University
Press.

World Economic Outlook, International Monetary Fund, Staff of the International
Monetary Fund, Washington, D.C.