RUDIGER DORNBUSCH

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Rudiger Dornbusch was born on 8 June 1942 in Krefeld in Germany. He studied social sciences at the university in Geneva, graduating in 1966.

He continued in his studies in the USA, in 1971 gaining a science-teaching PhD at the University of Chicago. He lectured at the University of Chicago, in Rochester and from 1975 up to the end of his life worked at MIT, where he was professor of the Economics Department. In his professional career he worked as an economics assistant at the Postgraduate Institute of International Studies, Geneva, 1966 – 1967, a university teacher at the Graduate School of Business, University of Chicago, 1971, an assistant professor at the Economics Department of the University of Rochester, 1972 – 1974, a research intern at the London School of Economics, summer 1974, a senior lecturer in international economics at the Graduate School of Business, University of Chicago 1974 – 1975, a senior lecturer at the Economics Department, MIT 1975 – 1978, and finally professor of economics at the Economics Department, MIT, 1978 – 2002.

On 25 July 2002 at the age of 60 the excellent professor of economics Rudiger Dornbusch died. He was a pre-eminent of the Massachusetts Institute of Technology. The focus of his scientific interest was macroeconomics and international economics. In his research he examined exchange rate changes, the issue of inflation, in particular hyperinflation, and the problems of international debt. His study "Expectations and Exchange Rate Dynamics", Journal of Political Economics, December 1976, otherwise known as "the overshooting paper" is considered a master step in economics theory. Dornbusch attempted to uncover the puzzling and highly volatile changes in floating currency exchange rates.

The study was published in 1976, i.e. three years after the collapse of the Bretton-Woods currency system based on fixed exchange rates. It was one of the first systematic attempts to explain, why following the introduction of floating currency exchange rates these fluctuated so sharply.

Professor Dornbusch frequently travelled to Europe and Latin America, where he lectured and actively worked on resolving problems of stabilisation policy. He made long study and scientific research stays in Brazil and Argentina. He often conveyed his interest in the current economic policy issues on the floor of the American Congress, where he spoke on specific economic policy issues and gave presentations at many international conferences. Professor Dornbusch took a lively interest in the application of his ideas in economic policy and was often an advisor in the field of high indebtedness and currency crises, which afflicted many countries in the Nineties.

He trenchantly accused the capitalism of the afflicted countries themselves as being responsible for the Asian currency crisis. At the time he gave the verdict "these are places where the government knows everyone's shoe size, but doesn't know how much they have borrowed from abroad". He similarly correctly foresaw the collapse of the Mexican peso during the crisis in the years 1994 – 1995 and the devaluation of the Brazilian real at the start of 1999.

In the last months of his life he recommended radical solutions to the Argentinean crisis including the international assumption of many economic decisions similar to the interventions of the League of Nations in Austria following the First World War. He regularly wrote editorials for newspapers and professional journals, in which he analysed the current macroeconomic issues of the USA and world economy.

Rudiger Dornbusch was a passionate debater. He always made a great impression through his intelligence and sharp thinking. Sometimes he acted aggressively or even sarcastically, but in the case of Professor Dornbusch good qualities were always underlined by intelligence and high mindedness. He liked to invite colleagues and students to his home, where he often discussed economics through the night. His doctoral dissertation represented a great step forward in creating a new theoretical approach to balances of payments. By including non-tradable goods he created the first equilibrium analysis of the effect of devaluation on the real exchange rate. The expression "overshooting" has spread far beyond academia and, among other things, entered the standard macroeconomics lexicon and is often used in commentaries on the financial market. Together with Stanley Fischer, who in 1988 – 1991 held the position of Vice-President and Head Economist at the World Bank in Washington, D.C. he wrote the textbook "Macroeconomics" (now in its eighth edition), which is used not only in the USA, but throughout

the world. It has been translated into numerous languages (including, in 1994, Czech). As the authors declared, it is the greatest honour for them when they see that their efforts spent have had such real results throughout the world. Dornbusch's flair for discussion was famous and S. Fischer said that Dornbusch took as a maxim Keynes' sentence "Words ought to be a little wild, for they are the assault of thoughts on the unthinking". Dornbusch was indeed unconventional, but it was this, among other things, that made him a popular author in the field of economics.

He worked as an economic and political adviser in many countries, particularly in Latin America, giving much advice to ministers and central bank governors, who in many cases were his former students.

The Dornbusch theory of international adaptation and interdependence of economies. Exchange rate overshooting.

Issues of macro-economic equilibrium in an open economy represent an important field in macro-economics. Economies under the influence of globalisation are becoming ever more interdependent. Business transactions and capital movements transfer cyclical developments from one country to another.

Interest rate changes in one country cause exchange rate and interest rate movements in other countries.

The international adaptation of individual countries in consequence of problems arising with an imbalance in the balance of payments is, by and large, possible in two ways:

1. a change of economic policy,
2. automatic adaptation mechanisms.

Economic-political measures use monetary and fiscal policy instruments, changes in customs duties and exchange rate changes. Automatic mechanisms are firstly: the balance of payments imbalance influences the money supply and thereby also spending, then secondly: unemployment affects wages and prices and thereby competitiveness.

An analysis of an open economy begins with these premises: fixed prices and a given exchange rate. The real exchange rate is also fixed. The real exchange rate is defined as:

$$R = \frac{eP_f}{P}, \qquad (1)$$

where:
e – is the nominal exchange rate
P_f – is the foreign price level
P – is the home price level

The exchange rate and foreign prices do not change, but domestic prices do change.

In an open economy with a fixed exchange rate an increase in the price level reduces demand. An increase in domestic prices leads to our goods becoming less competitive in comparison with goods produced abroad.

When the prices of goods produced domestically rises, then at a given exchange rate our goods become more expensive abroad and it becomes relatively cheaper for us to purchase foreign goods.

An increase in our prices is concurrently an increase in the relative price of goods produced by us, which shifts demand away from our goods towards imports, and likewise also lowers exports.

The economy will report a balance of trade deficit. Domestic prices are too high, or its income is too high that imports would be offset by exports.

For an economy to achieve its balance of trade equilibrium, it must become competitive, and thus produce more and import less.

How can a deficit be resolved?

In a system of fixed exchange rates it is possible for a central bank to use its reserves for financing the deficit – in accordance with the current exchange rate it would meet the excess demand for foreign currency ensuing from the balance of payments deficit.

An economy which has got into a balance of payments problem can also borrow foreign currency abroad.

If a current account deficit is financed by a loan from abroad, there arises the question as to how this loan will be repaid. If foreign creditors are convinced that an economy is able to meet its obligations (because for example its balance of payments deficit is an interim phenomenon, or they believe that the loan will be used for increasing the country's export productivity), loans will be available. Problems in repaying foreign debt can occur where loans are used for financing spending on consumption.

Maintaining and financing a current account deficit is not possible over the very long term. An economy must find a way how to adjust to the deficit, meaning how to completely, or at least partially, eradicate it. It can achieve this through automatic adaptation mechanisms or an appropriate policy.

Measures for restoring balance must be combined with measures directed at achieving full employment. Measures that support employment usually worsen the external balance and measures directed at creating a trade surplus affect employment.

To achieve concurrently the aims of internal and

external equilibrium it is generally necessary to combine measures shifting spending away from imports towards domestic goods with measures for reducing, or increasing spending.

One of the methods for balancing a current account deficit is to impose customs duties. But customs duties cannot be employed without restraint for adjusting the trade balance partly because of international organisations and agreements such as the WTO - World Trade Organisation, or the IMF - International Monetary Fund, which limit or prohibit the use of customs duties.

Another way of balancing a current account deficit is to lower aggregate demand. This means a policy of reducing spending. The main instrument for resolving a balance of payment deficits is devaluation, which must usually be combined with a restrictive monetary or fiscal policy. Devaluation means increasing the price of foreign currency expressed in domestic currency units. In the case of given nominal prices in two countries devaluation increases the relative price of imported goods in the devaluating country and lowers the relative price of exports from the devaluating country. Devaluation is a policy shifting spending between countries.

A country can achieve real devaluation, if the devaluation really does reduce the price of domestic goods against foreign goods. If we take the foreign price level Pf as given, real devaluation occurs if the ratio e/P rises, i.e. if the exchange rate increases by more than does the price level.

Under the assumption that inflation in the country is higher than that in its trading partners, maintaining the exchange rate at a fixed level means a continual decline in competitiveness. Many countries therefore try to avoid large deficits by using a crawling peg system.

In a crawling peg system the exchange rate is depreciated at a rate roughly corresponding to the inflation differential between the given country and its trading partners. A crawling peg is founded on the idea of maintaining the constant real exchange rate $R = Pf / (P/e)$ through the fact that e will grow as quickly as the ratio P/Pf.

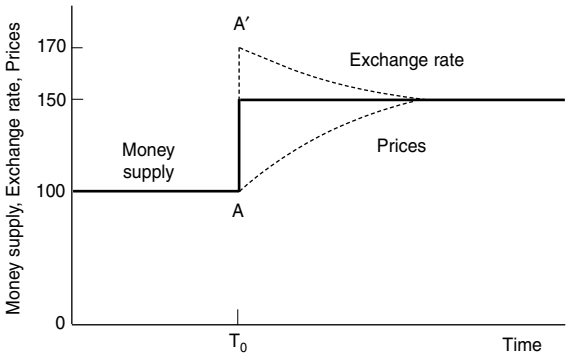
Often the opinion is presented that problems of external disequilibrium are by their nature monetary problems and that balance of payments deficits are a reflection of surplus money supply. In the case of any given balance of payments deficit a sufficient reduction in the money supply will restore external equilibrium. This is because monetary restrictions increase the interest rate and reduce spending, incomes and imports. The same result can be achieved via a strict fiscal policy; therefore the way of remedying an external disequilibrium is not especially of a monetary nature.

In a system of flexible exchange rates the issue is resolved as an output, the exchange rate and prices react to monetary and fiscal policy and how this reaction takes course over time. Monetary expansion has short-term and long-term effects. In the case of given prices, and fixed exchange rates and perfect capital mobility monetary expansion will lead to currency depreciation and an increase in incomes. Adaptation of the output is only transitional. In the long term monetary expansion leads to a depreciation of the currency and higher prices in the case of unchanged competitiveness.

Exchange rate overshooting

Monetary policy in the case of flexible exchange rates causes a quite individual adaptive process. An important sign of the adaptive process is that exchange rates and prices do not move equally quickly. Where monetary expansion pushes interest rates down, the exchange rate adapts immediately, whereas prices do so only gradually. Monetary expansion in this way leads in the short term to a direct and sudden change in relative prices and competitiveness.

Graph [1]



The graph contains a time trajectory of the nominal money supply, the exchange rate and price level. At the beginning the economy is in a long-term state of full equilibrium. All indices are assigned the value 100. At the time T0 the money supply is increased by 50 per cent, and depicted by the full line. The exchange rate depreciates immediately (a move in the index from A to A') by more than the increase in the money supply. Prices adjust slowly. In the short term the relative price of imports ePf grows quickly. Under the influence of improved competitiveness at time T0 output increases above the potential level and inflation arises. Prices rise and concurrently the exchange rate

[1] See Rudiger Dornbusch and Stanley Fischer: Macroeconomics, Prague: SPN and Foundation Economics, 1994, p. 553.

depreciates, whereby the initial overshooting is partially remedied. Prices in this time grow in order to balance the increase in money and the exchange rate tries to similarly replicate the higher level of money supply and correspond to the price level. In the long term nominal money, the exchange rate and prices grow in equal measure (by 50 per cent, from 100 to 150); real balances as well as the relative price of imports therefore remain unchanged. The process of exchange rate adaptation, depicted by the graph, highlights this overshooting.

The exchange rate overshoots its new equilibrate level, meaning that in consequence of the disturbance it first moved out of the equilibrium, which it should reach, only then gradually returning to long-term equilibrium. Overshooting means that changes in monetary policy have consequentially large changes on exchange rates.

In a floating exchange rate regime we often see that in reaction to some shock the actual value of the exchange rate misses the new equilibrium value. This can be explained by the different adaptation speeds of the market for goods and that for capital. Whereas the capital market adapts immediately, the market for goods exhibits a delayed reaction. If, in the case of two countries, one of them undertakes monetary expansion, lowering its interest rate, an outflow of capital occurs and the exchange rate subsequently depreciates. In the short term the currency depreciation leads to a worsening of the current account, since imported and exported quantities react only slowly to relative price changes. The exchange rate therefore depreciates further. After a certain period, however, the quantity of exported goods grows and the quantity of imported goods falls, whereby the exchange rate appreciates towards its long-term equilibrate value. Overshooting means that changes in monetary policy have consequentially large changes in exchange rates. This process of adaptation, described by Rudiger Dornbusch is known in economic theory as overshooting.

Conclusion. Following 1989, when we were considering how to reconstruct economic subjects at universities, I asked a friend to provide several world economic textbooks. From Washington he sent me the book "Macroeconomics", by R. Dornbusch and S. Fischer. This book was a guiding light for us in writing the first teaching texts on macroeconomics, forming syllabuses and teaching plans.

Most important works of Rudiger Dornbusch

- Macroeconomics, McGraw-Hill, New York, 1994 (with S. Fischer) 5th ed.
- International Economic Policy: Theory and Evidence, Johns Hopkins University Press, (Edited with J.A. Frenkel.
- Open Economy Macroeconomics, Basic Books, New York, 1980.
- Inflation, Debt and Indexation, MIT Press, 1983, (Ed. with M.H. Simonsen).
- Financial Policies and the World Capital Market, University of Chicago Press, 1983. (Ed. with P. Aspe and M. Obstfeld).
- Economics, McGraw-Hill, New York, 1987, 2nd ed. (with S. Fischer and R. Schmalensee).
- Restoring Europe's Prosperity, (with O. Blanchard and R. Layard) MIT Press, 1986.
- Dollars, Bebts and Deficits, MIT Press 1987.
- Macroeconomics and Finance, (Esseys in Honor of Franco Modigliani) MIT Press, 1987, (Ed. with S. Fischer).
- The Political Economy of Argentina, 1946 – 83, Macmillan, 1988. (Ed. with G. diTella).
- Exchange Rates and Inflation, MIT Press, 1988.
- Stopping High Inflation. (Ed.with M.Bruno, G.diTella and S.Fischer), MIT Press, 1988.
- The Open Economy: Tools for Policy Makers in Developing Countries. (Ed. with Leslie Helmers) Oxford University Press, 1988.
- Public Debt Management: Theory and History (Ed.with Mario Draghi) Cambridge University Press, 1990.
- Reform in Eastern Europe (jointly with O.Blanchard et al.) MIT Press, 1991.
- Global Warming: Economic Policy Responses. (Ed. with J.Poterba) MIT Press, 1991.
- The Macroeconomics of Populism in Latin America (Ed. with S.Edwards). MIT Press, 1991.
- East-West Migration (With Layard, Blanchard, and Krugman) MIT Press, 1992.
- Postwar Economic Reconstruction and Lessons for the East Today (ed. with W. Nolling and R.Layard) MIT Press, 1993.
- Stabilization, Debt, and Reform: Policy Analysis For Developing Countries, Prentice Hall, 1993.
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- Financial Opening: Policy Lessons for Korea, (edited with Y.C.Park), Korea Institute of Finance, International Center For Economics Growth, 1995.
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