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TRADE AND CAPITAL FLOWS: MIRAGE-D

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NON-TECHNICAL SUMMARY

In the MIRAGE trade policy simulation model, country current account balances are kept constant relative to world GDP, at their base year values, for the whole simulation period. Such a specification imposes no limit to country international investment positions, which do not appear explicitly in the model anyway. That rather unrealistic hypothesis could have an influence on trade flows, and consequently on trade policy simulation results. The work presented here seeks to stimulate discussion on how the model could be modified in that respect, by proposing an explicit modelling of the financial domain and country international investment positions.

As a first step, economic accounting concepts corresponding to the MIRAGE variables were carefully examined using the Fifth edition of the International Monetary Fund's *Balance of Payments Manual*. On that basis, new variables were defined to represent the principal components of the International Investment Position (IIP). Each country or group of countries in the model is represented by a single economic agent. This agent distributes its wealth among assets following a portfolio allocation model (Decaluwé et Souissi, 1994; Souissi, 1994; Souissi et Decaluwé, 1997). Wealth is allocated in three stages. It is first distributed between physical assets (productive capital), and financial assets (net foreign loans). At the second stage, on one hand, physical assets are allocated to industries and countries, and, on the other hand, the respective levels of financial assets and liabilities are determined. Finally, financial assets are distributed among borrowing countries or groups of countries.

This work has also been an opportunity to explore a mechanism for allocating investment among industries and countries along the lines of Tobin's « q » theory of investment, which is different from the gravity model of the basic version of MIRAGE. Demand is confronted to the supply of investment financing, which is nothing else than the demand for physical assets (capital ownership titles) from the portfolio allocation model described above. The allocation of investment among industries and countries is determined by the supply-demand equilibrium.

These ideas were incorporated into a modified version of MIRAGE called MIRAGE-D (D for « Debt »). Simulations were run for a 5-industry, 14-country aggregation. In addition to the usual MIRAGE output, results include indicators of country IIPs. On the financial side, the deepening debtor position of the United States and the rise of China as dominant creditor stand out clearly. A comparison of results obtained with MIRAGE and MIRAGE-D shows moderate but significant differences. In MIRAGE-D, countries whose net IIP is negative or falling receive less investment, and the growth of their GDP is slowed.

The latter has also been compared to an intermediate model, which integrates the portfolio management model of MIRAGE-D, while keeping MIRAGE's gravity model of investment allocation. In the intermediate model, investments in China are less than in MIRAGE-D (but more than in MIRAGE), while they are equal or greater in other countries or groups of countries. In addition investments in agriculture are higher in the intermediate model, and clearly lower in MIRAGE-D, than in MIRAGE.

Finally, a comparison was made of MIRAGE-D results obtained under different sets of elasticity values in the portfolio allocation model. These elasticities characterize the degree of flexibility in the distribution of wealth among assets. The outcome of that exercise is that the choice of elasticity values is far from benign, with strong elasticities leading to more chaotic results. While financial variables and IIPs are strongly dependent on portfolio elasticities, other results, however, are not too sensitive (except in the particular case of China, examined more closely in the paper).

The document concludes with a reflection on possible improvements that could be brought to MIRAGE-D.