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Human Capital and International Real Business Cycles*

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Standard international real business cycle models are generally unable to replicate the observed comovements of all the main aggregate variables: in particular, they generate low or negative international comovements in output, investment, and labour. I simulated a two-country, two-sector stochastic endogenous growth model that embodies an externality linking human capital across countries. This model is able to reproduce positive international correlations for all the main variables and is partially able to reproduce their ranking. These results are robust to changes in the entire set of parameters, as shown in a global sensitivity analysis performed by applying Canova's methodology. *Journal of Economic Literature* Classification Numbers: E32, F21, J24, O41. © 2000 Academic Press

Key Words: stochastic growth models; international comovements; investment comovements; human capital; knowledge spillovers

1. INTRODUCTION

In the last few years, international real business cycle (RBC) models, pioneered by the two-country extension of Kydland and Prescott (1982) provided by Backus *et al.* (1992), have attracted the attention of many international macroeconomists.[1] This popularity has not been challenged

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[1] Backus *et al.* (1995) and Baxter (1995) provide useful surveys of the current literature. For an introduction to new research directions, see Canova and Ubide (1998), Canova and Marrinan (1998), and Kehoe and Perri (1997).

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TABLE I
Simulated Average International Correlations in the Literature[a]

	Y	C	X	n
BKK (92)	−0.18	0.88	—	—
BKK (95)	−0.21	0.88	−0.94	−0.94
B-C	−0.02	0.97	−0.13	—
Baxter	−0.25	1.00	−0.20	−0.99

[a]Results are taken from Backus, Kehoe, and Kydland (BKK) (1992, 1995), Baxter and Crucini (B-C) (1993) and Baxter (1995) and refer to their benchmark parameterizations. The variables are, respectively, output (Y), consumption (C), investment (X), and time share devoted to labour (n).

by the fact that standard models were actually unable to replicate the stochastic properties of real data, as stated in Baxter (1995). All main aggregate variables (namely output, consumption, investment, and employment) are, on average, positively correlated across countries. Furthermore, the ranking of their international correlation coefficients generally follows a common pattern[2]: output is more correlated than employment, employment more than investment, and investment more than consumption. Standard two-country models with a single capital good and exogenous growth, such as Backus *et al.* (1992, 1995) and Baxter and Crucini (1993, 1995) among others, cannot replicate the sign of the coefficients, their absolute value, and even their rank. In particular, for plausible parameterizations they generate a high international correlation of consumption, very low or negative correlations of output and investment, and a negative correlation of employment, as shown in Table I. The mechanisms behind them are well known; Baxter (1995) provides a detailed description.

While the consumption discrepancy was addressed by Devereux *et al.* (1992) and Stockman and Tesar (1995), the output, investment, and employment discrepancies remain a puzzle. As Baxter (1995) says: "...a major challenge to the theory is to develop a model which can explain the international comovement in labour input and investment."

Some recent studies by Boileau (1996), Kehoe and Perri (1997), and Canova and Ubide (1998) addressed these issues. They seem to improve considerably on standard models as far as international comovements are concerned. The focus of my paper is nonetheless different: I retained a standard complete markets framework and examined the role of *human capital* in order to explain the international correlations of output, investment, and labour. Following Lucas (1993), I interpreted human capital

[2]Table AVIII in the Appendix summarizes the empirical evidence for 10 OECD countries.

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