What We Know Or Do Not Know About The Elasticity of Substitution:
Four Essays On Growth Theory

By

Debdulal Mallick
B.S.S., University of Dhaka, 1992
M.A., Delhi School of Economics, University of Delhi, 1995

Adviser: Robert S. Chirinko, Ph.D.

A dissertation submitted to the Faculty of the Graduate School of Emory University in partial fulfillment of the requirements for the degree of Doctor of Philosophy

Department of Economics

2007
Table of Contents

1. Growth and Slowdown of Nations: What Role for the Elasticity of Substitution?
   1.1 Introduction .......................................................... 1
   1.2 The role of $\sigma$ in economic growth ........................... 3
   1.3 Perpetual growth and slowdown in the Solow model ............. 5
   1.4 Calibration of $\sigma^c$ ............................................. 16
   1.5 Estimates of $\sigma (\hat{\sigma})$ .................................. 21
   1.6 Comparison of $\hat{\sigma}$ with $\sigma^c$ ............................ 23
   1.7 Discussions and Conclusion ...................................... 24
   References .................................................................. 26

2. The Role of the Elasticity of Substitution in Economic Growth: A Cross-Country Test of the de La Grandville Hypothesis
   2.1 Introduction .......................................................... 48
   2.2 $\sigma$ and per capita output growth ............................... 50
   2.3 Analytical framework .............................................. 53
   2.4 Data .................................................................. 59
   2.5 Results .................................................................. 62
   2.6 Conclusion ........................................................... 70
   References .................................................................. 71

3. The Substitution Elasticity, Growth Theory, And The Low-Pass Filter Panel Model
   3.1 Introduction .......................................................... 89
   3.2 The Implications of $\sigma$ for growth theory ...................... 93
   3.3 Estimation strategy: aggregate $\sigma$ ............................... 99
   3.4 Estimation strategy: industry $\sigma_i$'s ............................ 106
   3.5 Empirical results: homogenous industry $\sigma_i$'s ................ 117
   3.6 Empirical results: heterogeneous industry $\sigma_i$'s ............ 123
   3.7 Summary and conclusions ........................................ 124
   References .................................................................. 125

4. Reconciling Different Estimates of the Elasticity of Substitution between Capital and Labor
   4.1 Introduction .......................................................... 140
   4.2 Estimating equations ............................................... 144
   4.3 Estimation techniques .............................................. 148
   4.4 Results ............................................................... 165
   4.5 Discussions and conclusion ...................................... 178
   References .................................................................. 180