

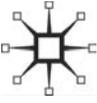
The Contribution of Human Capital towards Economic Growth in China

This page intentionally left blank

The Contribution of Human Capital towards Economic Growth in China

John Joshua

palgrave
macmillan



© John Joshua 2015

Softcover reprint of the hardcover 1st edition 2015 978-1-137-52935-0

All rights reserved. No reproduction, copy or transmission of this publication may be made without written permission.

No portion of this publication may be reproduced, copied or transmitted save with written permission or in accordance with the provisions of the Copyright, Designs and Patents Act 1988, or under the terms of any licence permitting limited copying issued by the Copyright Licensing Agency, Saffron House, 6–10 Kirby Street, London EC1N 8TS.

Any person who does any unauthorized act in relation to this publication may be liable to criminal prosecution and civil claims for damages.

The author has asserted his right to be identified as the author of this work in accordance with the Copyright, Designs and Patents Act 1988.

First published 2015 by
PALGRAVE MACMILLAN

Palgrave Macmillan in the UK is an imprint of Macmillan Publishers Limited, registered in England, company number 785998, of Houndmills, Basingstoke, Hampshire RG21 6XS.

Palgrave Macmillan in the US is a division of St Martin's Press LLC, 175 Fifth Avenue, New York, NY 10010.

Palgrave Macmillan is the global academic imprint of the above companies and has companies and representatives throughout the world.

Palgrave® and Macmillan® are registered trademarks in the United States, the United Kingdom, Europe and other countries.

ISBN 978-1-349-57469-8 ISBN 978-1-137-52936-7 (eBook)
DOI 10.1057/9781137529367

This book is printed on paper suitable for recycling and made from fully managed and sustained forest sources. Logging, pulping and manufacturing processes are expected to conform to the environmental regulations of the country of origin.

A catalogue record for this book is available from the British Library.

A catalog record for this book is available from the Library of Congress.

Contents

<i>List of Figures</i>	x
<i>List of Tables</i>	xi
<i>Preface</i>	xiii
<i>Acknowledgements</i>	xiv
Introduction	1
Structural transformational growth and the transformation of human capital	3
Uneven structural transformation between Chinese provinces	4
Aims of the thesis	5
Outline of the study	5
1 Neoclassical and Endogenous Growth Models	10
Introduction	10
A comparative analysis of neoclassical and endogenous growth theories	10
Human capital and the endogenous nature of technological change	16
Endogenous and exogenous factors as facilitators of economic growth	22
Conclusion	25
2 The Accumulation of Human Capital as a Factor of Production	26
Introduction	26
The accumulation of human capital and its transformation into economic growth	26
The complementarity between human capital and physical capital	28
The nexus between human capital and technological change and their effects on economic growth	31
Economic policies for economic growth through capital accumulation	36
Policies for human capital formation to enhance economic growth	40

	Policies for the provision of educational resources and educational performance	43
	Conclusion	50
3	Pathways of Human Capital towards Economic Growth	51
	Introduction	51
	Pathways of human capital towards economic growth and development	51
	Work processes and the applications of human capital	56
	The enhancement of productivity through human capital and technological change	61
	Human capital and the production possibility curve	68
	The international best-practice production function	69
	Conclusion	72
4	Human Capital Transformation and Cycles of Innovations	73
	Introduction	73
	Human capital theories, R&D and technology transfer	74
	Human capital and innovations as creative destructions	80
	The induced innovation hypothesis	88
	Innovation and product cycles as determinants of economic growth	91
	Learning-by-doing within a globalized economy	95
	The import-production-export cycle and the transformation of human capital	101
	The capital goods import-export cycle	104
	Human capital transformation: from comparative to competitive advantage	106
	Conclusion	108
5	Stages of Economic Development and Convergence and the Changing Demand for Human Capital	110
	Introduction	110
	Structural transformation and the effect on human capital	111
	Stages of economic development and changing demand for human capital	112
	The transformation of human capital through stages of economic growth	113
	The appropriateness of various types of human capital and the stages of development	117
	The contribution of human capital within different stages of economic development	120

	The contribution of human capital and economic growth with in different sectors of the economy	124
	The theoretical framework of absolute and conditional convergence	125
	Conclusion	130
6	Human Capital, Income Distribution and Economic Growth	131
	Introduction	131
	The wage structure and economic growth	132
	The effects of technological change on human capital and its associated wage levels	134
	Changes in human capital and their effects on the distribution of income	139
	Regional income distribution and human capital	143
	Provincial inequality of the spending of education	145
	The inequality of income across Chinese provinces	147
	Equity and economic growth	149
	Conclusion	154
7	An Economic Profile of China	155
	Introduction	155
	Economic reforms and their effects on Chinese economic development	155
	Market reforms and China's growth engines	161
	China within the global economy: the effect of the special economic zones and openness on Chinese development	163
	China's unequal development and the widening income gap	167
	China's move towards the international technological frontier	170
	Conclusion	174
8	Transformational Growth and Human Capital Transformation in China	176
	Introduction	176
	Perpetual structural transformational growth and human capital	177
	Foreign direct investment and the effect on human capital formation	179
	Export-led growth and its effect on human capital	183

The spill-over externalities if the open-door policy and infrastructure	184
The flying-geese pattern of economic development within a globalized economy	188
Conclusion	190
9 Convergence and Divergence between China's Provinces	191
Introduction	191
Convergence versus divergence between Chinese provinces: the formation of clubs	191
The empirics on economic growth and convergence between Chinese provinces	195
Comparative growth rates between Chinese provinces	197
Endogenous growth theory and Chinese provincial economic policies	198
Inter-provincial migration of surplus labour	199
Divergence of income distribution between China's provinces	204
Conclusion	208
10 Review of Empirical Studies on China	209
Introduction	209
Conflicting evidence of human capital contribution to GDP in cross-country studies	209
The contribution of human capital to Chinese provincial growth	211
Human capital and its effect on total factor productivity	215
Limitations of previous studies	219
Conclusion	220
11 New Evidence on the Contribution of Human Capital to Chinese Provincial Economic Performance	221
Introduction	221
The data-generating process	223
Data limitations	224
Econometric methodology	225
Measurement of variables	229
Human capital and Chinese provincial income levels	230
Human capital and Chinese provincial growth rates	235
Control variables	237
The effects of aggregation	238
The effects of spillovers	238
Interactions	238

Human capital and growth volatility	240
Human capital and Chinese provincial multi-factor productivity	242
Endogeneity	242
Conclusion	246
Conclusion	248
Structural transformational growth of China's economy	248
Endogenous technological change and human capital	250
Methods and findings	251
The widening gap of income disparity and convergence	251
Economic policies and human capital	254
New directions: the shift from comparative to competitive advantage	255
<i>Notes</i>	257
<i>References</i>	265
<i>Index</i>	297

List of Figures

I.1	Per capita GDP, China and Japan, 1500 to 1938	2
I.2	Per capita GDP, China and Japan, 1950 to 2001	2
I.3	Per capita GDP, China and 16 East Asian nations, 1950 to 2001	3
1.1	Endogenous and exogenous factors as facilitators of economic growth	23
2.1	Economic policies for economic growth through capital accumulation	38
2.2	Human capital accumulation and its effect on the supply of labour and income distribution	41
2.3	The flow of new entrants into the education system and labour force	42
3.1	The human capital and technological change pathways towards economic growth	52
3.2	The degree of embodied human capital as productivity functions	59
3.3	The application of human capital through work processes and transformation capital	61
3.4	Technological progress with human capital	63
3.5	The production possibility frontier	69
3.6	The international best-practice production function	70
4.1	The stylized capital-labour intensive product cycle	103
4.2	The capital goods import-export cycle	105
5.1	The human capital-unskilled labour transformation curve	114
5.2	The stylized stages of human capital transformation	116
6.1	Changes in Gini ratio: all of China, and urban and rural China	149
A7.1	Provincial map of China	175
8.1	The ABC of an economy which leads to transformational growth	178
9.1	The catch-up phenomenon between provinces	205

List of Tables

I.1	Share of GDP by sectors	7
1.1	Summary of models	24
2.1	Grade 7 Test	46
2.2	Average Mathematics and science scale scores of eighth-grade students	46
2.3	Summary	50
3.1	Output per worker and its components relative to U.S. values	67
3.2	Summary	71
4.1	Ownership of U.S. patents by countries: 1963–2003	79
4.2	R&D expenditures and number of researchers in 2002	80
4.3	Summary	109
5.1	The three stages of human capital transformation and their effect on the economy	118
5.2	Economic effect of level of education and physical capital on economic growth	123
5.3	Pooled mean effect of level of education and physical capital on economic growth	123
5.4	Summary	129
6.1	Population changes in East Asia between 1995 and 2007	136
6.2	Summary	154
7.1	Sources of economic growth in China	158
7.2	Summary	173
8.1	Summary	189
9.1	Shift in employment structure in Shanghai between 1952 and 1994	200
9.2	Summary	208
10.1a	Chinese regional production function studies: estimates of human and physical capital formation as a contribution to GDP	213
10.1b	Chinese regional production function studies: estimates of human and physical capital formation as a contribution to GDP	217
11.1	Chinese Cobb–Douglas provincial production functions, 1995–2005	232
11.2	Chinese Cobb–Douglas provincial production functions, aggregate measure of human capital, 1995–2005	233

11.3	Contributions of human capital to provincial output, regional classifications, 1995–2003	234
11.4	Industry shares and contributions of human capital, 1995–2005	235
11.5	Determinant of Chinese regional economic growth, 1995–2005: disaggregate measures of human capital	236
11.6	Determinants of Chinese regional economic growth, 1995–2005: aggregate measures of human capital	239
11.7	Determinants of Chinese regional economic growth, capital interaction effects, 1995–2005	240
11.8	Determinants of volatility of Chinese regional economic growth, 1995–2005: disaggregate measures of human capital	241
11.9	Chinese multi-factor productivity functions, 1995–2005	243
11.10	Contributions of human capital to provincial multi-factor productivity, regional classifications, 1995–2005	244
11.11	Determinants of Chinese regional economic growth, 1995–2005, treatment of endogeneity disaggregate measures of human capital	245
11.12	Summary of empirical findings	247

Preface

The structural transformation of a country not only has profound effects on the economy of a country, but also involves a cultural transformation.

Having gained three PhDs from Monash University, Melbourne University and Deakin University in Sociology, Education and Economics, respectively, I have a multidisciplinary interest in economic development and its concurrent structural transformation, especially within emerging economies.

My multidisciplinary interests therefore lead me not only to investigate transformational growth of emerging economies, but also to consider the educational requirements as well as the sociological impact that such transformations inevitably will involve. Hence, this book is one of the projects in which I am involved in concerning structural changes within emerging countries.

Acknowledgements

Special thanks are due to Chris Doucouliagos from Deakin University for his valuable comments, especially for his suggestions in regard to the statistical analysis, which were extremely helpful and are much appreciated. His suggestions will be further appreciated in my future endeavours in economic research. Special thanks are due to my wife Feng Yan for her continuous encouragement and support over many years.