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Van Hoa Tran
University of Wollongong, tvheco@uow.edu.au

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Gender Discrimination and Growth in Major Economies in Asia

*Tran Van Hoa**

Abstract

Economic growth, its determination and distribution have been the main objectives of normative and positive market economics over the years. Less focused is the effect of gender discrimination (or a lack of it) on growth from both the market and non-market perspectives in an economy, developed and developing. The paper implements and improves on a recent model of growth incorporating gender discrimination [see Rosen (1982) and Esteve-Volart (2004)] to empirically investigate the possible effect of this discrimination on growth in recent years in major countries in the Asian region. Some policy recommendations are also briefly discussed.

บทคัดย่อ

การเจริญเติบโตทางเศรษฐกิจ รวมทั้งปัจจัยกำหนดการเจริญเติบโตและการกระจายรายได้เป็นเป้าหมายหลักของเศรษฐศาสตร์เชิงตลาดแนวปฏิฐานนิยมและแนวบรรทัดฐานนิยมมานานหลายปี แต่ที่ได้รับความสนใจน้อยกว่าคือ ผลกระทบของการกีดกันทางเพศที่อาจมีหรือไม่มีต่อการเจริญเติบโตทางเศรษฐกิจทั้งในแง่มุมมองของตลาดและที่มีใช้ตลาดในระบบเศรษฐกิจที่พัฒนาแล้วและที่กำลังพัฒนา บทความนี้มีการใช้และปรับปรุงแบบจำลองการเติบโตทางเศรษฐกิจโดยรวมผลกระทบของการกีดกันทางเพศไว้ด้วย เพื่อทำการศึกษาเชิงประจักษ์ต่อผลกระทบที่เป็นไปได้ของการกีดกันทางเพศที่มีต่อการเจริญเติบโตทางเศรษฐกิจในระยะหลังในประเทศหลัก ๆ ของภูมิภาค เอเชีย นอกจากนี้ ก็จะมีข้อเสนอแนะทางนโยบายไว้อย่างย่อ ๆ อีกด้วย

* Department of Economics, University of Wollongong, Australia

Email: tvheco@uow.edu.au Website: <http://www.uow.edu.au/~tvheco/tvh.htm>

1 Introduction

Efficiency and equity are the primary concerns of market economics. Recent research in household economics or production, following the seminal work by Gary Becker, stipulates however that non-market economics, while being neglected by traditional researchers or policy-makers in the area, can account for at least as much as the Kuznets-type GDP in the SNA93 national income framework in even OECD countries (see Goldschmidt-Clemon and Pagnossin-Aligisakis, 1995). An important implication is that the role played by householders generally or by the female labour force in particular in an economy, developed and developing, has been seriously underestimated and not given due credit in an economic or social worth accounting sense (for a brief survey, see Ironmonger, 2000).

While the sources or the fundamental causes of growth can be numerous (see for example, Snowdon and Vane, 2005) and a typical choice of causality may reflect an analyst's preferred perspective or policy emphasis, the paper focuses particularly and novelly on gender contribution to growth in Asia. In this context, the paper implements and improves on a recent growth model (discussed by Rosen, 1982, and others, and proposed by Esteve-Volart, 2004) incorporating gender discrimination and its available proxy and, as an illustration of the model's empirical applications, it uses recent (1971-2001) relevant World Bank World Tables (WBWT) data for six major countries in Asia (China, Indonesia, Korea, Malaysia, Philippines, Thailand), to provide empirical findings on the potential impact of gender discrimination on development and growth in these countries for informed debates and possible policy formulation.

2 A Gender Model of Growth

The Rosen and Esteve-Volart theoretical gender model of growth (named say the REV model) analyses, in the labour market, the individual's decision between becoming a manager or a worker in order to explain the observation that managers' earnings at the top

level in large corporations or organisations are skewed to the right. The model's main assumptions are that there are multiplicative productivity interactions and the quality of supervision gets congested. Given a division between workers and managers in the labour market and three scenarios (labour market equilibrium without, with partial and with total gender discrimination), the REV model stipulates three propositions:

- (1) a fall in wages decreases the cut-off level of talent in the economy,
- (2) discrimination against females in managerial positions implies lower economic growth, and
- (3) gender discrimination in the overall labour market implies
 - (i) lower economic growth and
 - (ii) lower per capita GDP. Models where the decision is given by latent talent or risk aversion have been discussed by Lucas (1978) and Kihlstrom and Laffont (1979). Similar models in which other personal or imposed choices affecting or even blocking traditionally or institutionally the supply of labour to the market place are incorporated especially in the context of LDCs have not been implemented or reported.

The final REV model used by Esteve-Volart (2004) for estimation and policy analysis with Indian panel data is a panel linear regression model and can be simply written as

$$Y_{st} = \delta R_{st} + \xi X_{st} + \alpha_s + \gamma_t + u_{st} \quad (1)$$

where Y =per capita net domestic product, R =ratio of females to males in a certain class of the labour force, X =control variables, α =state effect, γ =year fixed effect, s and t denote state and time subscripts.

3 Implementation of Gender Discrimination Model with Non-Market Activities and Data

While a simple gender discrimination model of growth as described above requires *ideally* micro or unit record data on gender and market and non-market activities for empirical implementation, these data are currently not available (for current work of measuring non-market activities however, see Tran Van Hoa, 2004) for the scope of our study. We therefore focus on a simple variant of the model above for use with relevant officially published non-unit record and aggregate data (as available for example in the WBWT databases). As a result, we generalise the REV model above by assuming, as in other constrained maximising profit or minimising cost equilibrium analysis, that growth (that is, Y =the rate of change in GDP) is an arbitrary implicit function of R and X , that is

$$Y=Y(R,X) \tag{2}$$

When the data on R and X are not reliably available or unavailable to a certain level of disaggregation in practical implementation, the proxies of R and X or even only macro R and some approximations to the macro X s-in focus can be used. Of particular interest to us is that X have to reflect, to some extent, both market and non-market (that is, paid and non-paid, male and female) factors of production (or their use in productive activities in the household economy – see Ironmonger, 2000) and their interactions. As mentioned earlier, these data are currently not adequately available.

As a result, the use of appropriate proxies that are available in harmonised (internationally compatible) databases from the WBWT (or from other international organisations – eg, the OECD) is necessary in our study. Relevant variables of interest from a total market perspective for X in explaining Y include (a) socio-economic variables [eg, population (POP), (b) urban-to-total population ratio (URB) – see Esteve-Volart, 2004], female illiteracy ratio (FILL) reflecting custom/tradition or female bias/barriers or ineffective

government social and education policy in LDCs (see also Galor and Weil, 1996, for proxy of this variable for developed countries), (c) the important gender bias indicator of females in the labour force (FLF) and (d) capital/labour ratio (Esteve-Volart, 2004) or physical and social capital proxied in the sense of permanent income or wealth in the sense of Friedman, Ando and Modigliani by first-order or higher-order lag GDP (see also Arrow, 1999, and Fukuyama, 2000, for other definitions and measurements of social capital). As the data for the male counterpart of our variables are not available, we can use the degeneracy of the labour force identity for example (that is, total labour force = male labour force + female labour force) to derive further implications of our findings.

While FLF and growth (Y) in our model may be regarded by some analysts as having instantaneous circular causality in general, this may not be true for developing economies especially in Asia where, as emphasised above, FLF (and FILL) reflect more on ages-old custom, tradition, culture, religion or government social policy (exogenous factors) and less on free or competitive market conditions for factors of production. We also use FILL to proxy an indicator of non-market activities or unpaid work by females in an economy (see also Ironmonger, 2000, and Tran Van Hoa, 2004). A long-term effect may be reflected also by the sample size of 30 years 1971 to 2001 available for our study even though a proper investigation on this can be carried out in the future with cointegration analysis.

Making use of our earlier work's useful modelling specification (eg, Tran Van Hoa, 1992), we can develop our gender model of growth not in a *a priori* or subjectively imposed functional form (eg, linear or log-linear) but in a *function-free (that is, approximating any unknown arbitrary functional)* form for empirical estimation. The required time-series data are available over the sample period 1971-2001. In this period, development and growth were also likely affected by major internal and external shocks (favourable economic and political climates or damaging financial or non-economic crises – see Johansen, 1982). Our model for empirical implementation in the presence or not of gender discrimination can then be written as a linear (using Taylor series planar approximations) equation in the rates

of change (denoted by %) of control variables (including gender bias as measured by FLF and FILL) and binary dummies for shocks. That is

$$Y\%_t = b_1 + b_2Y\%_{t-1} + b_3POP\%_t + b_4URB\%_t + b_5FILL\%_t + b_6FLF\%_t + b_7CRISIS_t + u_t \quad (3)$$

where the b's denote the elasticities, CRISIS=economic and other crises (eg, the 1975 oil price hikes (C75), the October 1987 stock market Black Friday crash (C87), the 1989 Tiananmen Square turmoil (C89), the 1991 Gulf War (C91), the 1997 Asia crisis (C97), and u is the error term reflecting other unknown growth factors (see Frankel and Romer, 1999). From our previous studies, these shocks were known to have a persistent non-decaying impact and quantified econometrically as such. The required data were retrieved from the 2003 WBWT.

For pragmatic reasons, the paper focuses only on 6 countries and in 2 groups of diverse geographical features and different Rostow development stages: two fast-growth East Asia countries (China and Korea), and four developing ASEAN countries (Indonesia, Malaysia, Philippines and Thailand) that built 'miracle' economies in the 1960-90s but also suffered severely the damaging effect of recent Asia crises including SARS and the avian flu.

4 Substantive Empirical Findings

To obtain our model's parameter estimates with optimal statistical properties, we can use the currently available methods such as the traditional Ordinary Least Squares (or Maximum Likelihood), or other improved estimators with superior mean-squared-errors or Wald risks such as the positive Stein (Baranchik, 1973) or the two-stage hierarchical-information or 2SHI (see for example Tran Van Hoa, 1985, 1986b and (with Chaturvedi), 1988, 1997) for Equation (3). These methods can treat Equation (3) as a single-equation model or as a structural equation in a simultaneous-equation model if auxiliary equations

(representing possible circular causality between Y and FLF for example) are available or if the RHS quantitative variables are suspected of being measured with errors (Tran Van Hoa, 1986a). Other dominance properties of the 2SHI method are discussed by Namba (2000, 2001).

For comparison with other studies in the literature, we report below only the OLS or AR(1) results of our model for these 6 countries (see Table 1).

Table 1. Impact of Gender Discrimination on Growth in Major Countries in Asia, 1971 to 2001

	China	Korea	Indonesia	Malaysia	Philippines	Thailand
Const	-50.14**	25.58	57.15	137.41**	2.45	7.74
FLF	26.05**	8.87**	16.66	-4.83	-20.68@	15.44@
POP	1.80	1.62	-15.09	-43.98**	2.10	1.44
URB	-1.63	-10.70	-12.79	-12.84	-1.18	1.50
FILL	-14.24**	-1.85*	-5.41	-7.45*	-2.31	-0.01
K	0.38**	0.39*	0.16	-0.02	0.04	0.34**
C75	-45	-0.18	-8.82	-14.30**	-7.53	-3.26
C87		0.63	-1.38	18.36**	-2.65	6.68*
C89	-2.51					
C91	23.69**	-21.79	-2.48	-24.75**	-7.93	-3.54
C97	-16.60	-0.39**	-0.13	-17.53**	-2.32	-8.02**
R ²	0.85	0.84	0.33	0.54	0.37	0.66
F	12.77**	-84.11#	1.15	-94.17#	1.35	4.47**
DW/h	0.85	2.31	0.71	2.35	0.17	-0.73

Notes. **: significant at 5%, *: significant at 10%, @: significant at 15%, #: the loglikelihood, used in GLS estimation to remove AR(1) error terms. DW: Durbin-Watson statistic, h: Durbin h-statistic. K= GDP(-1) and used as a proxy for accumulated physical and social capital.

5 Evidence on Gender Discrimination in Major Economies in Asia and Its Economic and Social Policy Implications

From the table, we note that the estimated gender growth models, as proposed and with the exception of Indonesia and the Philippines, fitted the actual data of the countries in the study well. The graphs of actual and estimated growth (not reported here) also show the ability of the models to historically emulate all peaks, troughs and turning points accurately over the whole sample period (a feature the R^2 , as a modelling performance criterion, may not be able to track). While it may be inappropriate to claim that these partial models of growth with a focus on gender as a possible principal cause can explain a country's growth *a fortiori* very well, some empirical results on the testable in-focus features of the models can be summarised below for possible analysis in social and public policy.

Is there evidence of gender discrimination and its adverse impact on growth in the 6 Asian developing countries under study?

This question is the main focus of our study. Findings in Table 1 reveal that less discrimination (as approximated by higher female participation in the labour force - FLF, *ceteris paribus*) would likely promote higher growth in China, Korea, Indonesia and Thailand. A reverse impact is found for Malaysia and the Philippines. The positive findings for FLF in Table 1 are compatible with Esteve-Volart's reported results for India and those results are based on micro data. Strong statistical evidence on the FLF impact above is found only for China (which has the highest estimated elasticity, namely 26.05, for FLF) and Korea (8.87), and weaker evidence is obtained for the Philippines and Thailand. FLF appears to have no statistically significant effect on growth in Indonesia and Malaysia. Given the limitation on the aggregate and proxy nature of the data used, the empirical findings support in general the adverse impact of gender discrimination on growth in the 6 countries under study.

Would enhanced female literacy in LDCs in Asia help to increase growth?

The testable proposition in our gender model is that enhanced female literacy would facilitate female entry into the paid labour force and hence would be counted towards GDP in an SNA93 framework. For Indonesia, the Philippines and Thailand (LDCs), the answer is yes in an economic-theoretic context for all 6 countries under study. The highest impact (-14.24) is found again for China followed in the second place by Malaysia (-7.45). Esteve-Volart's findings for India in this case are the opposite (that is, a rise in female (and male) literacy rate reduces growth) but the statistical evidence is very weak. The results in Table 1 show that a reduction in female illiteracy ratio in Indonesia, the Philippines and Thailand would have some positive but statistically weak contribution to growth. On the contrary, for China, Korea and Malaysia, there is evidence that enhanced female literacy would significantly statistically promote higher growth.

Would more accumulated physical and social capital be useful in promoting growth in major countries in Asia?

Using a simple first-order past GDP as a proxy for this capital which follows essentially the proposition by Friedman, Ando and Modigliani and not Arrow (1999) or Fukuyama (2000) as discussed earlier, the findings in Table 1 indicate that, with the exception of Malaysia, all other in-focus countries' development and growth can benefit from this capital proxy. Strong or acceptable (that is, at the 5% or 10% significance level) statistical evidence is found for China, Korea and Thailand, and less so for Indonesia and the Philippines. The capital impact finding (with the estimated elasticity of 0.34) for Thailand which is the major developing country in Asia and with presumably and relatively less physical and social capital endowment or accumulation than say Japan (a developed country and with the estimated capital elasticity of 0.37 using the same gender model- not reported here) is interesting in the context of capital utilisation efficiency and worth further investigation for say industry policy analysis.

Would more urban migration promote or deter higher growth?

In contrast to the expected beneficial effects of physical and social capital above, migration from rural to urban areas is found to have a negative impact on growth in the countries under study except Thailand. While the impact for Thailand is statistically weak, it is nevertheless not negligible (1.50). The social implications of this finding on rural-to-urban migration would be interesting for social and rural experts in Thailand and need further and detailed study. Statistical evidence on this variable for the other 5 countries in our study however is also very weak.

Do crises affect growth?

As expected, different types of crises and shocks experienced by or transmitted to the countries under study have different effects and with different intensity. The implications are that each of these 6 countries should, as a result, have reacted differently in terms of responses, rescue and management policies to the crises. The standard one-fit-all rescue policy of the International Monetary Fund in this case for example would seem to be inappropriate to prescribe to and to be adopted by all these crisis economies.

More specifically, while the 1975 oil crisis has uniformly a negative impact on all 6 countries under study (with statistically significant damages only for Malaysia however), the 1987 stock market crash in the West has a strong beneficial effect on Malaysia, Thailand and Korea in that descending order. The Tiananmen Square turmoil in China in 1989 is found, as expected, to have a damaging but statistically weak impact on the country's development and growth. While the 1991 Gulf War negatively impacts Korea, Indonesia, Malaysia, the Philippines and Thailand, it surprisingly provides China with a statistically significant higher growth. The 1997 Asia meltdown also appears to have affected badly the growth path of all 6 countries under study with the worst happening to Malaysia (-17.35) and Thailand (-8.02). In our previous study using the same gender model, this crisis was

found not to have affected Australia's growth. One reason is that Australia was able to divert part of its international trade to the European Union during the crisis. This finding and explanation appear to lend support to the view of some economists in Australia that "The Asia crisis. What crisis?" (see Tran Van Hoa, 2000).

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