Accounting for Asian Economic Growth: Adding Gender to the Equation

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Abstract

Absent from the important debate on the determinants of rapid Asian growth is the role of gender inequality. This paper argues that gender wage inequality has stimulated growth, with Asian economies that disadvantaged women the most growing the fastest from 1975 to 1990. Low female wages have spurred investment and exports by lowering unit labor costs, providing the foreign exchange to purchase capital and intermediate goods which raise productivity and growth rates. These results contrast with recent studies that argue income equality at the household level contributed favorably to Asian growth by reducing political conflict. The divergent findings can be explained by the fact that gender norms and stereotypes that convince women to accept their low status curbs labor and political unrest, stimulating investment. The results indicate that which group bears the burden of inequality in the process of economic growth matters**.**

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J16 Economics of Gender

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I. Introduction

One of the significant economic events of the twentieth century was the rapid growth and structural transformation of several Asian economies. Faltering growth in other developing regions of the world has generated a strong interest in unraveling the determinants of Asian economic success. The plethora of research done on the region's growth experience has stimulated a debate centered on the relative importance of "market-friendly" strategies versus state intervention in markets. One part of the debate already appears decided—that income equality and Asian exports have stimulated growth—although the causal link between exports and growth continues to be disputed.

This paper seeks to integrate the role of gender into the debate and argues that an accurate understanding of the sources of Asian growth requires analysis of the macro-level effects of gender inequality. Supporting evidence is provided to show that women's disadvantaged status, which works to lower their relative wages, has been a stimulus to investment, exports, and by extension, economic growth. This finding contrasts sharply with the work of those who believe income equality in Asia aided growth.

II. The Determinants of Growth in Asia: The State of the Debate

The growth record of Asian economies is impressive. The average annual growth rate of per capita GNP for the region was more than triple that for Latin America and the Middle East during the period 1965-91. By contrast, growth in Sub-Saharan Africa was stagnant (Table 1). There is, however, substantial variation within the region, with the earlier industrializers (South Korea, Singapore, Hong Kong, and Taiwan province of China) growing faster than the remaining Asian economies under consideration.

While Asian economies have attained varying degrees of economic well-being as measured by levels of per capita GDP (Table 2), growth has in general been accompanied by structural transformation, with manufacturing output growth high in most cases. The growth rate of exports in the region is also high, but again varies considerably by country. The countries with the highest growth rates of exports also have relatively higher rates of GDP growth, leading to the claim by many scholars that openness to trade contributed to growth.

Why did many of the Asian economies grow so rapidly? What policies, institutions, and social conditions induced the degree of structural transformation that has occurred in that region, and how can these also explain divergent growth rates within the region?

A. Evolutionary Economists on State-led Growth

Evolutionary economists claim that in the most rapidly growing Asian economies, the state has "led the market" rather than simply exhibited friendliness.[1] Alice Amsden (1989)

further argues that the state has deliberately gotten prices wrong—distorting fundamental prices such as that of credit, imported inputs, and other costs of production—in order to stimulate investment in targeted areas and to move the economy up the industrial ladder. Her thesis rests on the view that late industrializing countries require a coherent set of state policies that promote the adoption of new technologies to raise productivity.

Amsden and others operating from an evolutionary perspective (cf. Richard Nelson and Howard Pack 1998) argue that using new technologies effectively requires new ways of organizing the production process, a certain set of skills, and familiarity with new markets. Succeeding with new technologies requires not only entrepreneurial risk-taking and good management, but also a facilitating state role to move firms to invest in activities in which they might not otherwise take risks. Accordingly, the distinguishing feature of successful East Asian economies is state policies directed at overcoming private market failure (Ha-Joon Chang 1994).

Yilmaz Akyüz, Ha-Joon Chang, and Richard Kozul-Wright (1998) note that state measures also boosted profits above their free-market levels (created rents), thus serving as a stimulus to investment, and creating the *capacity* to invest. Just as the state provided carrots, it also carried a stick that it used when necessary. The disciplining factor was the state's willingness to withdraw subsidies from firms if they did not meet well-established performance targets.

Efficiency wage payments also played an important role in a number of Asian economies, according to Amsden (1989).[2] Large firms paid predominantly male workers high wages to induce them to exercise their intelligence on the job, necessary if firms were to effectively adapt borrowed technologies. Low wages were not the answer in Asia or in other late-industrializing countries, she argues, since these alone could not raise productivity.

Most authors writing from this perspective concur with mainstream theory that trade has been a stimulus to growth in Asia. The nexus between trade and growth, however, is largely seen as the ability of exports—not unrestricted trade—to help countries overcome the balance-of-payments constraint, since to move upscale requires sufficient foreign exchange to purchase best-practice technology. Esfahani (1991) provides empirical support for this claim.[3] Ajit Singh (1994), emphasizing the narrower causal relationship between exports and growth, argues that it is not close integration with the international economy that stimulated growth in Asia, but "strategic openness"—the adoption of selective trade policies to support the state's industrial strategy.[4]

B. Old and Reformed Neoclassical Perspectives

Mainstream perspectives on this issue are influenced by neoclassical growth theory which, in its earlier incarnation, was shaped by the Solow model (1956). Solow models output growth using a Cobb-Douglas production function aggregated across the entire economy, with growth attributable to increases in factor inputs and exogenously determined technical progress. Early versions of the model were tested for industrialized countries using the total factor productivity (TFP) approach, which is based on a growth-accounting methodology that decomposes the sources of growth into three components: the growth of the capital input, growth of the labor input, and the (unexplained)

growth in productivity of all factors (TFP).

The production function, which forms the basis of growth accounting exercises, takes the following form

$$Y = A\,K^{\alpha}\,L^{\beta} \tag{1}$$

where Y is output, A is exogenous technical progress, K is the capital input, and L the labor input. To arrive at an estimable equation, we take natural logs and differentiate both sides of equation (1) with respect to time to arrive at growth rates of variables, yielding

$$dlogY_t = dlogA_t + \alpha dlogK_t + \beta dlogL_t \tag{2}$$

where d is the difference operator. The first term on the right is TFP or the contribution of exogenous technical change to output, while the coefficients α and β represent the elasticities of output with respect to capital and labor, respectively. This supply-side approach, because it assumes full employment, ignores potential demand-side problems. Also, the widely used Cobb-Douglas version assumes constant returns to scale as well as perfectly competitive markets, with factors priced according to their marginal products, affecting interpretation of the coefficients.

These difficulties have not been rectified, but some recent models have improved on the Solow model. Later versions "augment" the Solow model with additional factors, such as human capital (Gregory Mankiw, David Romer, and David Weil 1992), while new growth theory addresses more explicitly the determinants of technical progress. Technical progress in the new generation of models has been variously attributed to: 1) firm and state R&D expenditures, 2) public spending on education and infrastructure, 3) trade policies, and 4) institutional factors, including the political economic implications of income equality.

1. Factor Accumulation and Asian Growth

Virtually all of the empirical studies that use this theoretical framework to analyze the sources of Asian growth note the important contribution of high rates of capital accumulation.[5] Some have also explored empirically the determinants of investment and linked high investment rates to macro-level policies that provided for macroeconomic stability and let markets operate freely (cf. Vittorio Corbo 1996; Felipe Larraín and Rodrigo Vergara 1998). Gary Fields (1985) and others point to what they believe to be the absence of labor market distortions such as minimum wages. This unfettered environment, they argue, has created the conditions for firms to undertake investments conducive to growth such as capital accumulation, restructuring, and innovation.

Recent work also points to the role of human capital accumulation in stimulating Asian growth, with the World Bank (1993) arguing that educational investments focused on primary and secondary education that were appropriate to the level of development in Asian economies were a source of growth. One study (Walter McMahon 1993) goes so far as to argue that it is human capital, not technical progress, that has led to rapid growth in the region.

2. Technical Progress

More hotly disputed are estimates of the relative contribution of technical progress. Some empirical studies claim that technical progress in Asia has been minimal with most growth due to the accumulation of factors (Alwyn Young 1995; Paul Krugman 1994). Nelson and Pack (1998) as well as Dani Rodrik (1997) argue convincingly, however, that there is a fundamental indeterminacy in the measurement of physical capital since new capital equipment itself embodies technological change. Because technical progress can only take place through the introduction of new machines, even replacement investment is associated with technical progress. This lends an upward bias to the coefficient on the growth rate of the capital stock in growth-accounting equations, reducing the size of the residual TFP. Nelson, Pack, and Rodrik argue that one cannot rule out a significant role for technical progress in Asian growth.

3. Economic Openness, Export Orientation and Growth

Among those who believe that TFP growth is substantial in Asia, there exist a variety of viewpoints on exactly what factors have stimulated technological change. Reformist neoclassical economists claim that governments adopted a "market friendly" approach, providing a stable macroeconomic environment, a well-functioning bureaucracy, and a reliable legal framework, all without succumbing to the temptation to distort prices (World Bank 1993).

The "market friendly" approach in Asia included openness to trade, a policy stance that many writers argue can contribute to technical advance (Ann Harrison 1995; Jeffrey Sachs and Andrew Warner 1995; John Helliwell 1996). Their claim is motivated by several arguments. Economic openness exposes domestic firms to foreign competition, forcing them to become more efficient; the result is a better allocation of resources and increased productivity. Trade liberalization that stimulates exports on the basis of comparative advantage also expands market size, leading to economies of scale. More recently, a number of mainstream economists have begun to concur with some evolutionary theorists that economic openness is not an end in itself, but rather is a means to promote technological change as domestic firms are exposed to or are given access to best-practice technologies (Michael Hobday 1995).

Empirical tests of the openness/free trade hypothesis are mixed and depend on the measure of openness that is used. Broader measures of openness such as the effective rate of protection or the black market exchange rate do not perform particularly well, but export growth (or exports as a share of GDP) does appear to be robustly related to output growth (Harrison 1995; Ross Levine and David Renelt 1992).[6]

4. Institutions, Income Equality, and Growth

An important part of the mainstream story of the determinants of Asian growth has been that income equality is central to the region's success (World Bank 1993). Income equality may facilitate human capital formation, thereby providing a stimulus to growth (Ode Galor and Joseph Veira 1993; Felipe Larraín and Rodrigo Vergara 1998). Mainstream theorists further argue that

broadly shared gains derived from export-oriented growth dampen the potential for political conflict, thereby reducing uncertainty and stimulating investment. An equitable distribution of income also reduces the potential for distributional conflicts that might influence the state to enact destabilizing macroeconomic policies (Jose Campos and Hilton Root 1996; Rodrik 1997; William Easterly and Ross Levine 1997; Alberto Alesina and Dani Rodrik 1994).

Larraín and Vergara (1998) test this hypothesis directly and find evidence that an equitable distribution of income, measured at the household level, stimulates growth and investment. They claim that this factor at least partly explains growth differentials between Asia and Latin America. Focusing on differential growth rates among Asian economies only, Rodrik (1997) provides evidence that income inequality and ethno-linguistic diversity are negatively related to measures of institutional quality and, by extension, growth. He contends that ethnically diverse societies and those in which income distribution is unequal have a harder time maintaining high-quality institutions—and this slows growth.[7]

In sum, amid the disparate views on the determinants of Asian growth, both evolutionary and mainstream perspectives concur on the positive role of exports insofar as they generate domestic access to foreign technology. There is also some convergence of opinions on the positive effects of income equality on growth, although the reasons advanced differ. In sharp contrast to these views, the following section makes the argument that inequality measured along gender lines has been a stimulus to growth in the region, via its positive effect on both exports (by increasing access to technology) and investment.

III. Gender and Export-Led Growth

A. Gendered Characteristics of Economic Outcomes in Asia

The gendered characteristics of Asian growth stand out in several regards. Young women, most of them single, have formed a large and rising share of the paid labor force since the adoption of export-oriented strategies. Women's share of manufacturing jobs is also rising and is notably higher than in the economy as a whole in most cases (Table 3). Further, within the manufacturing sector, women have been sequestered in labor-intensive industries that produce primarily for export (Table 4). In Thailand, a large number of women have also found employment in another major export industry—the sex trade.[8] Filippinas, in contrast, have served as an exported supply of labor to other Asian economies to seek employment as domestics, remitting to the home country a portion of their earnings. Asian women's labor has thus been a primary resource in the generation of foreign exchange via the sale of exports.

Women employed in the manufacturing sector receive significantly lower wages for their work than men, although there is a large degree of variation in gender wage inequality, even within Asia. As the data in Table 5 show, some of this variation can be explained by differences in educational attainment, itself a reflection of gender inequality. But even after correcting for productivity-related differentials, the gender wage gap remains large. Figure 1 provides a time series look at the "efficiency" gender wage gap (the wage gap corrected for differences in educational

attainment) in selected Asian economies. A large and in some cases widening wage gap (such as Taiwan province of China and Hong Kong) may seem anomalous in a region in which export growth is rapid, producing a strong relative demand for female labor. However, institutional structures, coupled with patriarchal gender norms and stereotypes, limit women's bargaining power, holding down their wage gains relative to men's.

Country-specific analyses delineate the state's role in perpetuating gender norms and stereotypes that disadvantage women. For example, Ping-Chun Hsuing (1996) documents the role of the Taiwanese state in promoting homework by married women through its "Living Rooms as Factories" program which ensured the availability of a cheap labor force for export goods production.[9] This program was coupled with "Mother's Workshops" designed to reinforce traditional values in the community. The goal was to encourage women to continue to provide unpaid labor to the family and larger community, simultaneously with pursuing their factory work.

By contrast, in Korea, the state reinforced gender norms by condoning "the marriage ban"—the widespread employer practice of requiring women to quit work upon marriage (Stephanie Seguino 1997b). This practice has had a dual effect: by limiting women's job tenure it limited their organizing ability and wage gains. It also ensured that unpaid female labor was available to the patriarchally structured household when women married, avoiding male resistance to the state's development strategy.

In Singapore, the intersection of gender and ethnicity has been prominent in that country's growth strategy. The state has regulated the supply of low-paid female Malaysian immigrant workers who fill slots in export manufacturing firms. In contrast to upper-class, educated Chinese women who are citizens, the female Malays, as guest workers, can be expelled during economic downturns and for acts that might jeopardize their ability to work (e.g., pregnancy) or lead to permanent residence in Singapore (such as marriage with a Singapore national). In this way, the state maintains an elastic labor supply, relying on ethnicity to justify its dismissal of any responsibilities to these workers (Pang Eng Fong and Linda Lim 1982; Jean Pyle 1994).

Many authors have pointed out that women's cheap labor has helped to make Asian economies successful by lowering unit labor costs of export goods (Lucie Cheng and Ping-Chun Hsiung 1998; Stephanie Seguino 1997a and 1997b; Walden Bello and Stephanie Rosenfeld 1990). The empirical question is whether gender relations at the micro-level that influence labor costs in export industries have had a macro-level effect on Asian rates of economic growth.[10] That question is taken up in the next section.

B. Gendered Growth Theory

There has been little theoretical consideration of the role of gender in influencing macroeconomic outcomes.[11] Several possible links between micro-level gender relations and the performance of the macroeconomy are, however, readily apparent in the feminist literature. We focus on one here—the macro effects of gender discrimination that influences job access and wage payments. The Asian practice of segregating women into labor-intensive manufacturing export industries can serve to

artificially lower their wages below those of men, generating lower export costs than would be the case, absent patriarchal structures.[12] These lower labor costs substitute for currency devaluation, making exports more competitive. To see this, consider the following export function

$$E_X = Z\,(eP_X^*/P_X)^{\psi} \quad Z > 0, \qquad 0 < \psi < \infty \tag{3}$$

where E_X is export demand, Z is a constant, e is the nominal exchange rate, P_X^* is the foreign currency price of competing products from other countries in the world market, P_X is the price of exports in domestic currency, and ψ is the price elasticity of exports, assumed to be high for the major exports of developing Asian economies. The term in parentheses is the real exchange rate for exports and is positively related to export demand. Thus as P_X falls, E_X rises.

Assuming mark-up pricing, P_X can be written as

$$P_X = (1+\mu)(w_f a_X + eP_n^* n_X), \qquad 0 < \varphi < 1, \tag{4}$$

where μ is a flexible mark-up over unit costs, w_f is the female wage, a_X is the average labor coefficient in the export sector, P_n^* is the foreign currency price of imported intermediates, and n_X is the import coefficient in the export sector. The size of the mark-up μ is influenced by the degree of external competition and unit costs. As can be seen, a decline in female wages causes the domestic price of exports to fall.

In addition to the demand-side stimulus (on exports) of low female wages in Asia, productivity growth may also be enhanced. Because these economies are late industrializers, they are also technology borrowers. Exports generate the foreign exchange needed to purchase, from industrialized countries, the sophisticated technologies that can raise productivity and stimulate growth. Low female wages make exports more competitive, and are linked to technology access that promotes productivity growth. Low female wages also substitute for currency devaluation, allowing countries to conserve on scarce foreign exchange reserves while holding down the nominal cost of imports used extensively in goods production. Together, these effects lead to the hypothesis that gender wage differentials that reflect the degree of discrimination against women will be positively correlated with growth, assuming male wages accurately reflect labor productivity and thus serve as a benchmark.

The growth rate of the capital stock (proxied as the investment rate) may also be influenced by gender inequality. This is because efforts to lower wages in the export sector (e.g., by "crowding" women into this sector) alleviate pressure on the mark-up μ, raising the profit share of income and resulting in a class redistribution of income, as can be seen in equation (4) above. Thus, gender wage inequality may have a positive effect on investment spending. This effect is in addition to its stimulus to exports and productivity growth.

Finally, lower wages for women raise the real male wage. To illustrate this, we can write the real male wage for a two-sector economy with men concentrated in the "home" (nontradeable) goods sector and women in the export sector, as

$$\omega_M = \left(\frac{w_m}{P_H^{(1-\delta)} P_X^{\delta}} \right) \qquad (5)$$

where ω_M is the real male wage, w_M is the nominal male wage, P_H is the price of home goods, and δ is the share of export goods consumed domestically. Low wages for women that raise the real male wage can reduce distributional conflicts between male workers and their employers, reducing uncertainty associated with investment, stimulating investment in the nontradeables sector, and potentially attracting foreign investment.

Asian data provide some support for the hypotheses that gender wage inequality is a stimulus to growth and investment. Figure 2 shows the average annual rate of GDP growth for 1975-95 plotted against a measure of gender wage inequality—the log difference of male and female wages—and shows that wider gender wage gaps are associated with faster growth. Figure 3 delineates the relationship between investment as a share of GDP and gender wage inequality. Again we observe a positive relationship between these two variables.[13]

Further, there may be differential effects on growth of increases in female and male labor force participation, resulting from the gendered division of labor between paid and unpaid work. Men's failure to provide caring labor to the household implies that the opportunity cost to their movement into paid labor is close to zero. Conversely, women perform a significant amount of caring labor that contributes to the productivity of household members. As a result, moving women from unpaid to paid labor may entail social costs that partly or completely offset the benefits of this shift. The positive effect of increasing women's labor force participation on output may therefore be less than for men. The extent to which this effect might be observed in Asia, though, is mitigated by most of these economies' reliance on young unmarried women and in Taiwan province of China, by the employment of married women in home work.[14]

While these factors indicate an inverse relationship between gender equity and growth, we need to control for additional factors that may be influencing the rate of growth. A growth-accounting approach is used for consistency with the methodology of many recent studies that have considered the determinants of Asian growth. The basic growth equation is specified as

$$Y_{it} = A_{it}\, F(K, LFF, LFM, HK)_{it} \qquad (6)$$

where Y is output, A is technological change, K is the capital stock, LFF and LFM are, respectively, the female and male labor supply, HK is human capital, *i* is the country index, and *t* is time.

Our hypotheses about the role of gender imply that the determinants of technological change can be decomposed into: 1) country-specific fixed effects, 2) a time effect common across all countries (used to pick up factors in the global economic environment such as the oil price shock that may influence output), and 3) the effect of specific and changing country conditions that influence the growth rate of exports. In this latter category, we focus on female/male wage

differentials. More formally, technical change can be described as

$$A_{it} = C_i\,(1 + \varphi t)\, e^{\sigma WGAPit} \qquad (7)$$

where C_i is the country-specific time-invariant effect, φ measures the effect of external factors over time that affect growth not otherwise included in the model, WGAP is the gender wage gap, and σ is the effect of gender wage differentials on growth.

Substituting (7) into (6), taking natural logs, differentiating with respect to time, and using the fact that $\log(1 + \eta) \approx \eta$ yields

$$d\log Y_{it} = \varphi + \Sigma\lambda_i + \alpha_1 \mathrm{WGAP}_{it} + \alpha_2 d\log K_{it} + \alpha_3 d\log LFF_{it} + \alpha_4 d\log LFM_{it} + \alpha_5\, d\log HK_{it} + \varepsilon_{it} \qquad (8)$$

where d is the difference operator, φ is the growth rate of technological change when variables are measured at the mean, $\Sigma\lambda_i$ are fixed effects, WGAP is the gender wage gap, and ε is the error term, assumed to be normal. From (4), the coefficient α_1 is equal to σ.

Estimation of (8) for Asian economies alone with cross-sectional data and period averages will yield unreliable estimates due to limited degrees of freedom. An alternative method is to use an expanded sample of semi-industrialized export-oriented economies for which gender-disaggregated wage data are available. The sample used in this analysis is in Appendix I along with information on data sources. A second method is to use five-year averages of the enlarged data sample and estimate this as a panel data set to capture the effects on growth of the independent variables both across countries and over time within countries. Both sets of results are reported below.

C. The Data and Measurement of Variables

Data cover the period 1975-95. GDP is measured in 1985 prices and from this, growth rates are calculated for the sample countries. The growth rate of the capital stock is proxied as the growth rate of gross domestic fixed capital formation.[15] Female and male labor supply are measured as the percentages of women and men 15 and over that are economically active. The data for women are especially subject to measurement error since the variable moves cyclically as women withdraw from the labor force during economic downturns. Population over the age of 15 may be a better measure of labor supply and this measure is also tried. Given the significant productive but unpaid labor women carry out, we may find a negative or insignificant coefficient on the female labor supply variable, while that on the male labor supply is expected to be positive, indicative of men's minimal participation in household and caring labor. The growth rate of human capital is measured used average total years of educational attainment per person over 15, as well as average years of secondary education.

Two measures of the gender wage gap are used. One is a basic wage gap variable, WGAP1, measured as $\mathrm{Log}(W_M) - \mathrm{Log}(W_F)$ where W_M and W_F are male and female earnings, respectively.[16] Earnings data are corrected for hours worked where possible (in most cases).[17]

If women are less productive than men as workers, however, lower female wages will be coupled with a higher labor coefficient than the one that would be observed for male workers on average [see (4) above], and we would therefore not expect unit labor costs to be lower in export industries as a result of employing primarily women. To control for productivity differentials, therefore, a second measure (WGAP2) is used, called the "efficiency" gender wage gap. This measure takes into account differences in women's and men's secondary educational attainment, and is measured as follows:

$$WGAP2 = \text{Log}\left(\frac{W_M}{SYRM}\right) - \text{Log}\left(\frac{W_F}{SYRF}\right) \qquad (9)$$

where SYRM and SYRF are average years of secondary education per male and female 15 and over, respectively. A wide gender wage gap, coupled with a relatively high educational attainment for women, should exert a positive effect on exports (via the effect on unit labor costs) and thus technological change and economic growth. In the sense that education reflects productivity, this correction may be valid. Of course, education may not accurately reflect productivity if factors other than skills determine job access. Thus it is useful to evaluate the effects of both measures of the gender wage gap on economic growth. Alternatively, productivity differentials can be accounted for by entering as a control variable along with WGAP1 the logarithmic difference of female and male educational attainment, measured as average years of secondary (or total) education for those 15 and over. This approach is also used in the analysis that follows.

D. Growth and Gender Wage Differentials

Table 6 reports results of estimating equation (8) with data measured as period averages. Given the heteroskedasticity problems generally encountered with cross-sectional data, the estimates here were obtained with White's variance-covariance matrix. Because of limited degrees of freedom, the labor force variable is not gender-disaggregated.

Equation 1 is the basic growth-accounting equation without the gender wage gap variable. The constant term represents the portion of growth due to TFP growth and indicates that for this sample of countries, 2.5 percentage points of output growth were due to increases in total factor productivity. Capital accumulation has a positive and large effect on growth. The effect of increases in the labor force on the growth rated of GDP is negative, but small, and is also statistically insignificant. Finally, the growth rate of the human capital stock, measured as average years of secondary education per person over 15, is unexpectedly negative but insignificant.[18]

The basic wage gap variable (WGAP1) is entered in equation 2. The size of the intercept as well as the coefficient on the capital stock variable are smaller in this regression, while labor supply and human capital variables remain the same in size and significance. The positive sign on the wage gap coefficient suggests that, among countries in this sample and net of additional factors that influence growth, a larger gender wage gap stimulates growth. In particular, a 0.10 point increase in

WGAP1 leads to a 0.16 increase in the growth rate of GDP. Equation 3 replaces WGAP1 with the "efficiency" wage gap variable. This too is positive, although the size of the coefficient is somewhat smaller. Finally, in equation 4, we use WGAP1 and control for productivity differentials with EDGAP, the log difference of female and male secondary educational attainment.[19] WGAP1 continues to be positive and significant in that regression.

Because the wage gap may be proxying for fixed effects in the cross-country regressions, it is useful to estimate the growth equation using panel data with data measured as five-year averages for the period 1975-95. This approach allows us to capture the effect of changes in variables across time as well within countries. The regressions are estimated using a "within" estimator of a two-way error components model.[20] These results are shown in Table 7.

Equation 1 reports the results of estimating the full growth accounting equation specified in equation (8) above, with labor force variables measured as female and male population over 15 to address multicollinearity problems and without the wage gap variables. The size of the coefficient on the capital stock is smaller than in the cross-country regressions, but is significant. The gender-disaggregated labor force variables are of the predicted signs, although small in terms of impact on growth. The human capital variable is positive in this regression as would be expected, and the coefficient indicates that growth in education has a similar impact on growth as growth of the physical capital stock. The human capital variable coefficient is, however, insignificant. In equation 2, WGAP1 is added and is positive and larger than in the cross-country regressions. Again, the result is consistent with the argument that gender wage inequality is a stimulus to growth, not only across countries, but over time within countries. Equation 3 in Table 7 replaces WGAP1 with WGAP2. The wage gap variable has a negative sign and is also insignificant in this regression. An explanation for this is that by using WGAP2, we effectively restrict the coefficients of WGAP1 and EDGAP to be the same but of opposite signs. The data clearly reject this restriction. Equation 4 does not impose any restrictions on the coefficients of WGAP1 and EDGAP, with the result that the coefficient on WGAP1 is again positive but is smaller than in equation 2, and the coefficient on EDGAP is also positive and larger than that on WGAP1. Note that this result differs from the cross-sectional results where EDGAP was negative, smaller, and insignificant. This indicates the usefulness of fixed effects models, which yield better estimates by allowing the intercept term to vary across units.

In general, these results provide consistent evidence that gender wage inequality is a stimulus to growth.[21] The results of the labor supply and human capital variables are less robust. They suggest the need for further work to investigate the costs and benefits of moving women as compared to men into the paid labor force, and the effect of educational attainment on economic growth over time.

E. The Gender-Investment Nexus

For a variety of reasons explored above, gender inequality may also affect growth through its impact on investment spending, including its role in raising profits. To explore this hypothesis, investment as a share of GDP is regressed on gender wage inequality, using period average data and two well-established control variables that measure macroeconomic stability—the rate of inflation and variance of real GDP growth.[22] Table 8 reports results of those regressions.

The results for equation 1 show that inflation and variance of real GDP growth have negative effects on investment as a share of GDP, possibly due to their contribution to an environment of economic uncertainty. The basic wage gap variable (WGAP1) has a positive and again significant effect on investment. The size of the coefficient on this variable indicates that a 0.10 percentage point increase in the gender wage gap will yield a 1.38 percentage point increase in investment as a share of GDP. The coefficient on WGAP2 is smaller (equation 2) and the adjusted R^2 is notably lower. Finally, equation 3 indicates that when we control for educational differentials with EDGAP, WGAP1 continues to be positive and significant. Figure 4 shows the effect of gender wage inequality on investment (using WGAP1) after netting out the effect of the remaining independent variables. The data clearly indicate the positive relationship between investment and gender wage inequality. Note also that accumulation rates are high in the Asia region as a whole, but even among countries in this region, capital accumulation is positively affected by a wider gender wage gap.

IV. Gender Wage Inequality and Income Distribution

A. Gender Inequality and the Size Distribution of Income

It is useful to examine more closely the implications of the empirical results presented here which conflict with the findings of the recent research by Larraín and Vergara (1998), Rodrik (1997), and others who claim that income equality promotes growth. Income distribution data used in mainstream analyses are measured at the household level. This may be an inaccurate measure of inequality, however, since the assumption that income is pooled and distributed equitably within the household is not well founded (Folbre 1997).

Instead, microeconomic models of household bargaining indicate that access to income, once it reaches the household, depends on a member's bargaining power. Members' power is determined by their fallback position, including wages and human capital stock. Gender wage inequality, because it weakens women's fallback position relative to men's, can lead to their weaker bargaining power, negatively affecting their access to and control over household income (Shelley Lundberg and Robert Pollak 1993; Elissa Braunstein and Nancy Folbre 1998; Michael Carter and Elizabeth Katz 1997). Thus, because of gendered differentials in power and access to resources in households, reliance on household-level data to measure the distribution of income can lead to underestimation of the degree of income inequality. A more accurate measure may be the one used here, which captures both interclass distribution of income (between women workers and capitalists) and intraclass (and therefore intrahousehold) distribution of income between women and men.

In Asia, the divergence between income inequality measured at the household level and gender wage inequality is stark. Figure 5 plots a commonly used measure of income inequality (the ratio of the income share of the top 20% of households to the bottom 20%) against a measure of gender wage inequality, and shows that household income distribution is most equal in Asian countries with the greatest degree of gender inequality.[23]

If income equality, measured at the household level, fails to capture gender differences in

income, and gender inequality matters for growth, why does this situation not lead to the negative consequences suggested by Rodrik and others? A likely possibility is that women who have internalized gender norms and stereotypes that circumscribe their economic status relative to men may be less likely to protest their conditions. The political conflict that might be anticipated does not materialize. Indeed, this result suggests that just *who* bears the inequality in capitalist growth matters.

B. Gender Inequality and the Functional Distribution of Income

Jong-Il You (1998) argues that the role of equity depends on whether one is referring to the household distribution of income or the functional distribution of income (the relative shares of income going to capitalists and workers). You claims that an equitable distribution of income at the household level is good for growth because it allows households to finance human capital investments, although, in Asia, families have differentially invested in men's education (Susan Greenhalgh 1985).

The relationship between growth and the functional distribution of income differs, however. A high profit share of income (which is implied by a low wage share) is also a stimulus to investment and therefore spurs growth. This occurs because first, profits are the raison d'etre of capitalism, and second, profits are a source of financing for investment. You further argues that profit shares are high in Asia, and that this partially explains rapid growth in the region.

The implication of a positive relationship between growth and profits in Asia is that there is a trade-off between growth and the functional distribution of income. This relationship is pictured in Figure 6 as a downward-sloping growth-equity curve in g x e space, where g is growth of GDP and e is equity measured as the share of income going to workers. You has argued that effective institutions and policies that translate profits into high savings and investment have made the growth-equity trade-off less painful, reducing the potential for political conflict. This factor causes the growth-equity curve to shift out to the right as national income rises.

The role of gender inequality elucidated here fits You's framework in that a decline in the wage share that depends on women's wages falling relative to capitalist profits will stimulate growth. A more gendered portrayal of these relationships, however, is shown in Figure 7. Here gender inequality, that is, the unequal distribution of income between women and men measured as women's share of wage income (female wage payments multiplied by women's share of employment), is plotted on the x axis, and growth on the y axis. The negative slope of the growth-gender equity (g-ge) curve underscores the role of gender inequality highlighted in the empirics discussed above. Movement to the left along the g-ge curve implies that women's economic status is worsened vis à vis capitalists and men. It indicates that efforts to raise women's share of wage income will result in a decline in the growth rate of the economy. Figure 8 plots these data for Asian economies.

The shift up of the g-ge curve in Figure 7 implies that additional policies may be used to stimulate growth, such as financial sector policies and the types of industrial policies described by

Amsden (1989). In those cases, the growth-gender equity trade-off may be made less painful. For example, in Figure 7, the move from point a to point b may be representative of trends in Taiwan province of China. From 1975 to 1995, women in Taiwan province of China have become worse off relative to men and capitalists, and their share of manufacturing income has fallen. But they are absolutely better off in terms of wage income (though female employment in manufacturing has fallen in recent years), perhaps at least partially compensating for the decline in their relative status. The challenge for those concerned with equity is to develop policies that make the curve flatter and eventually positively sloped (Figure 9), so that growth is stimulated, rather than hampered, by gender equity measured as the female share of wage income.

V. Summary and Conclusions

The many stories of the sources of rapid Asian growth can by now be divided into two categories: 1) The mainstream story: a liberalized trade regime and a "market friendly" environment in which there is a limited role for the state, coupled with rapid capital accumulation, are the main sources of growth; and 2) The heterodox story: state intervention to overcome market failures and an export orientation have helped to shape the accumulation process, moving late industrializing economies up the industrial ladder. Supportive institutions in the forms of a competent state bureaucracy, investment in human capital, and income equality are seen by both camps as important as well.

Neither camp has seen viewed low wages and wage repression an important part of the explanation for rapid Asian growth and high rates of investment. Indeed, Amsden (1989), representing the evolutionary economists, argues that Asian economies could not grow solely on the basis of low wages. There is indeed merit to the argument that low wages do not suffice, given the numerous developing economies with low wages but poor economic performance. To claim, however, that low wages are not sufficient does not by extension imply that low wages for women have not played <u>any role</u> in Asian growth.

This paper argues that gendered accounts of Asian growth are necessary to fully understand the success of the most rapidly growing of these economies. The evidence presented here indicates that those Asian economies with the widest wage gaps between men and women grew the most rapidly. It further suggests that investment is positively linked to gender wage inequality. How can the positive stimulus of gender inequality on investment and growth be reconciled with the major lines of reasoning on the sources of Asian growth?

The low relative wages paid to women sequestered in export industries complement state-level policies in first-tier NICs (Newly Industrialized Countries) which directed investment to targeted industries and helped firms move up the technological ladder. Women's low wages stimulated export sales, providing the foreign exchange necessary for these economies to pursue their import substitution and modernization programs. The extent of state intervention has been of course been much lower in Thailand, Indonesia, and Malaysia. These countries nevertheless exhibited relatively high growth rates as they moved to adopt an export orientation. In these second-tier NICs, it is the success with exports—and by extension women's relatively lower wages—that

attracted massive capital inflows in the form of portfolio and direct investment in the mid-1980s and early 1990s. Rapid export growth provided insurance to foreign lenders that the foreign exchange necessary to pay back loans would be forthcoming.

An additional stimulus to Asian investment results from women's socialization, which leads them to accept their economic and social status, reassuring investors that labor strife will be unlikely.[24] Further, labor peace in capital-intensive industries, where unrest might be costly, was bought at least in some countries with high wages for men and exclusion of women from these jobs. Women's lower wages and, in some cases, dismissal from employment upon marriage, have maintained their lower bargaining power not only relative to employers but also to men. This may be seen as a form of compensation to men since it maintains their access to and control over women's labor and assures men's economic dominance in the household.

Cheng and Hsiung (1998) note that political legitimacy in Asian economies has been founded on continued growth and social stability. Gender inequality serves both goals: it bolsters profits and stimulates exports and therefore growth and, at the same time, it reinforces male workers' control over women, reinforcing the stability of a patriarchal gender system. To argue that the success of some Asian economies is a result of income equality seems, in light of these facts, ironic.

The evidence from Asia is that inequality has been functional to growth under some conditions, and that it has been supported by those higher up on the economic ladder. The challenge for feminist economists, however, is to determine whether growth with equity is possible, and if so, how? If we understand that the sources of Asian growth include gender discrimination, what sets of policies and development strategies can be adopted to engender economic growth that is fairly distributed not only by class, but also by gender and ethnicity?

Table 1.- Average Annual Rates of Per Capita GNP Growth, by Region, 1965-91

East Asia		**6.5%**	
	Hong Kong	6.1	
	Indonesia	4.5	
	Korea, Rep. of	7.3	
	Malaysia	4.0	
	Philippines	1.2	
	Singapore	6.6	
	Taiwan province of China		7.1
	Thailand	4.6	
Latin America		**1.8**	
Middle East and North Africa		**1.8**	
Sub-Saharan Africa		**0.2**	

Source: Helen Hughes (1995).

Table 2.-Asian Growth Indicators

Economies	Real Per Capita GDP 1990 in 1985 International Prices	Growth Rate Mfg. Output 1979-93	Growth Rate Merchandise Exports, 1970-93	Growth Rate GDP, 75-95
Hong Kong	$14,849	--	13.2%	7.3%
Indonesia	1,974	3.4%	6.6	6.3
Korea	6,673	14.6	16.8	8.0
Malaysia	5,124	10.9	8.6	7.0
Philippines	1,763	3.1	5.1	3.2
Singapore	11,710	8.3	12.4	7 5
Sri Lanka	2,096	11.9	3.5	4.5
Taiwan province of China	8,063	10.7	13.1	8.0
Thailand	3,580	12.6	12.6	7.7

Source: GDP data from Penn World Tables, 5.6. Merchandise export and manufacturing data are from World Development Report 1995, except for Taiwan province of China which are for 1965-90 and are from DGBAS (various years).

Table 3.-Female Share of Labor Force and Manufacturing Employment, 1975-95

Economies	1975 Female Share of : Labor Force	Mfg. Jobs	1995 Female Share of: Labor Force	Mfg. Jobs
Hong Kong	34.5	46.8	36.4	45.0
Indonesia	32.6	47.1*	40.6	46.6
Korea, Rep. of	35.3	34.2	40.5	40.0
Malaysia	32.3	42.3*	38.2	50.8
Philippines	34.0	45.7	36.6	45.6
Singapore	29.9	40.7	36.8	45.0
Sri Lanka	25.9	32.3	35.7	52.2
Taiwan province of China	32.9	47.9	37.7	44.2
Thailand	47.8	42.8	47.0	50.4

Source: World Bank, World Development Indicators 1998; International Labour Organization, Yearbook of Labour Statistics (various years); and for Taiwan province of China, DGBAS (various years).
* 1976
 1979

Table 4.-Women's Share of Jobs in Major Export Industries, Selected Countries 1977-90

	a) Textiles	b) Clothing	c) Electronics	Total (a-c)
Colombia				
1977	33.0%	80.0%	NA*	49.9%
1984	34.3	79.8	NA	55.9
1990	-- **	--	NA	--
Cyprus				
1977	--	--	--	--
1984	66.5	83.2	45.8	78.8
1990	72.3	86.5	33.5	81.8
Hong Kong				
1977	48.7	70.3	NA	62.7
1984	47.1	69.1	NA	62.4
1990	42.2	68.3	NA	60.0
Korea				
1977	69.0	73.0	55.3	66.9
1984	65.7	76.7	52.0	64.3
1990	57.3	72.0	48.7	56.9
Malaysia				
1977	--	--	--	--
1984	63.7	89.4	73.7	75.2
1990	57.8	85.3	75.3	75.3
Philippines				
1977	--	--	--	--
1988	46.6	80.0	63.8	66.9
1990	48.4	79.6	64.9	67.9
Singapore				
1977	--	--	--	--
1984	66.8	88.2	75.0	77.6
1990	58.4	87.1	71.0	73.3
Sri Lanka				
1977	52.6	82.8	56.0	56.0
1984	57.5	89.1	72.8	72.8
1990	50.8	89.4	76.3	76.3
Taiwan province of China				
1977	69.3	81.4	62.5	69.1
1984	64.7	80.2	66.8	68.4
1990	64.7	80.2	54.6	58.7
Thailand				
1977	--	--	NA	--
1984	75.0	93.0	NA	81.3
1988	75.6	81.9	NA	92.4

Source: Data are from ILO *Yearbook of Labour Statistics* (various years).

* NA indicates that employment in that sector is relatively low and the sector is not a major exporter.

* Two dashes (--) indicates that data are unavailable for that year.

Table 5.-Gender Wage and Educational Differentials in Asia, 1975-95

Economies	Ratio F/M Earnings	Educational Attainment Female	Male	Ratio F/M Educ. Attainment
Hong Kong	73.2%	7.6	9.2	83.0%
Indonesia	54.2	3.5	4.7	75.0
Korea	48.5	7.9	9.9	80.0
Malaysia	50.5	4.6	6.5	70.0
Philippines	87.0	6.7	6.7	100.0
Singapore	54.4	5.2	6.3	83.0
Sri Lanka	79.6	5.3	6.1	86.0
Taiwan province of China	64.1	6.5	8.7	64.1
Thailand	66.7	4.7	5.4	87.0

Note: Educational attainment is measured as average years of education for persons 15 and over. Education data are from Barro and Lee (1996). Earnings data are compiled by author from International Labour Organization Yearbook of Labour Statistics (various years) except for Taiwan province of China which are from DGBAS (various years).

Table 6.- Determinants of GDP Growth: Period Averages

Variable	Eq. 1	Eq. 2	Eq. 3	Eq. 4
Constant	0.025 (3.71)*	0.019 (2.79)**	0.026 (4.19)*	0.019 (1.97)***
dlogK	0.623 (12.39)*	0.560 (9.01)*	0.609 (11.85)*	0.558 (7.26)*
dlogLF	−0.190 (−0.93)	−0.130 (−0.69)	−0.363 (−1.98)***	−0.126 (−0.64)
dlogHK	−0.345 (−1.10)	−0.349 (−1.21)	−0.238 (−0.76)	−0.350 (−1.16)
WGAP1	(2.23)**	0.016		0.017 (1.79)***
WGAP2			0.014 (2.13)**	
EDGAP			(−0.03)	−0.011
Adjusted R^2	0.837	0.862	0.849	0.853
F-Statistic	33.54*	30.89*	27.75*	23.07*

Note: Numbers in parentheses are t-statistics. a single asterisk (*) denotes $p < 0.01$, a double asterisk (**) $p < 0.05$, and a triple asterisk (***) $p < 0.10$.

Table 7.- Determinants of GDP Growth: Panel Data

Variable	Eq. 1	Eq. 2	Eq. 3	Eq. 4
dlogK	0.331 (4.30)*	0.331 (4.79)*	0.358 (4.28)*	0.334 (4.99)*
dlogLFF	−0.001 (−2.19)**	−0.001 (−1.20)	−0.001 (−2.24)**	−0.001 (−1.01)
dlogLFM	0.001 (2.29)**	0.001 (1.25)	0.001 (2.34)**	0.001 (1.05)
dlogHK	0.340 (0.38)	−0.300 (−0.71)	0.358 (0.88)	−0.317 (−0.77)
WGAP1	(3.64)*	0.041	(3.11)*	0.034
WGAP2			−0.003 (−0.19)	
EDGAP			(2.36)**	0.058
Adjusted R^2	0.432	0.546	0.420	0.575
DW	2.081	1.944	2.089	1.953
F-Statistic	14.68*	17.26*	10.80*	15.60*

Note: Numbers in parentheses are t-statistics. a single asterisk (*) denotes $p < 0.01$, a double asterisk (**) $p < 0.05$, and a triple asterisk (***) $p < 0.10$.

Table 8.- Determinants of Investment: Period Averages

Variable	Eq. 1	Eq. 2	Eq. 3
Constant	0.197 (12.46)*	0.249 (19.41)*	0.221 (12.10)*
WGAP1	0.138 (4.43)*		0.147 (4.74)*
WGAP2		0.084 (1.93)***	
Inflation	−0.078 (−5.13)*	−0.068 (−2.76)**	−0.072 (−4.44)*
VarGDP	−1.057 (−2.05)**	−3.097 (−3.15)*	−0.234 (−0.41)
EDGAP			−1.606 (−1.93)***
Adjusted R^2	0.646	0.322	0.638
F-Statistic	9.734*	2.534***	9.388*

Note: N=20. Numbers in parentheses are t-statistics. a single asterisk (*) denotes $p < 0.01$, a double asterisk (**) $p < 0.05$, and a triple asterisk (***) $p < 0.10$.

Figure 1.-Efficiency Gender Wage Gap
(Wage Gap Adjusted for Education)

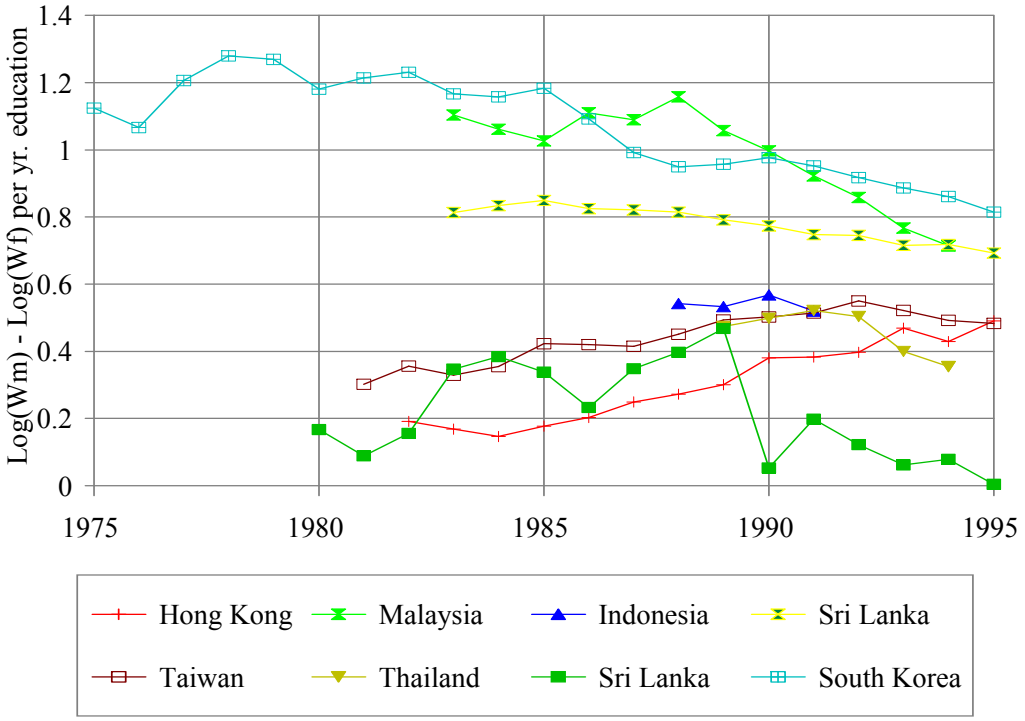


Figure 2.-Growth Rate of GDP, 1975-95
and Gender Wage Gap

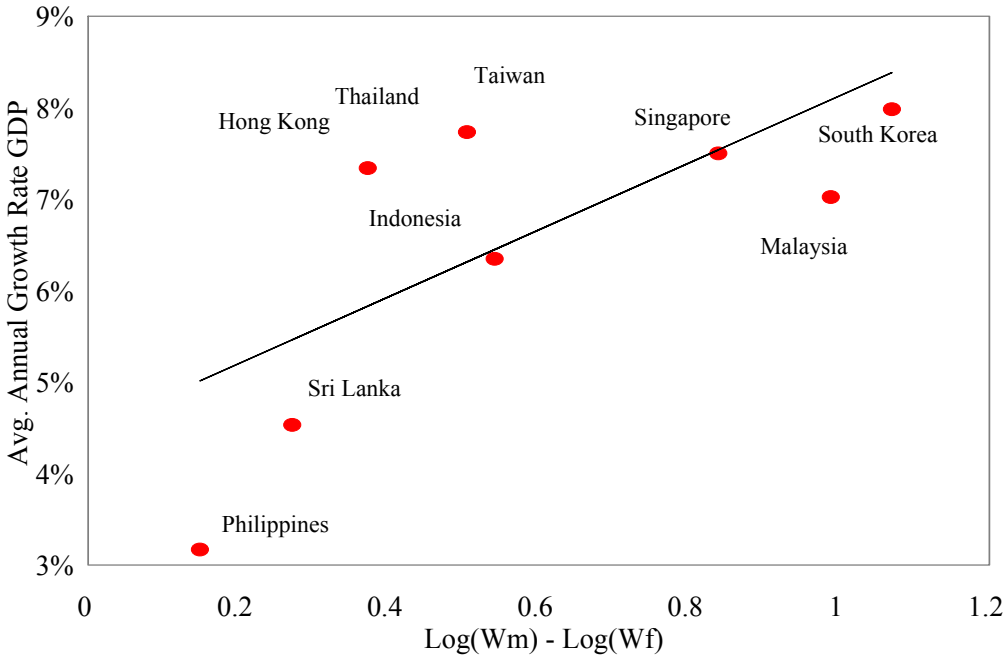


Figure 3.- Investment and the Gender Wage Gap, 1975-95

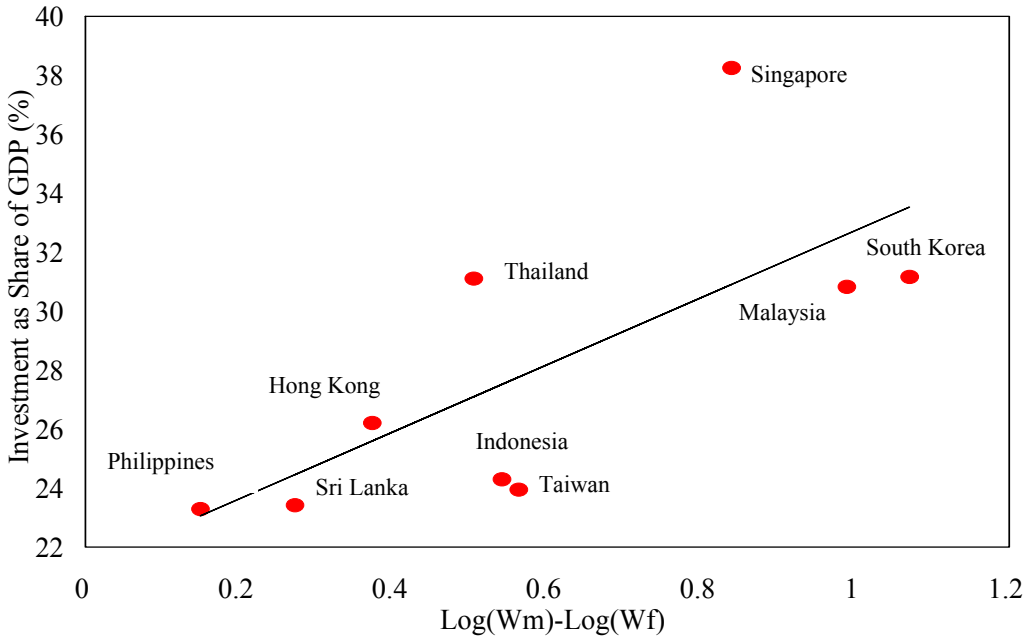


Figure 4.-Partial Correlation Between
Gender Wage Gap and Investment

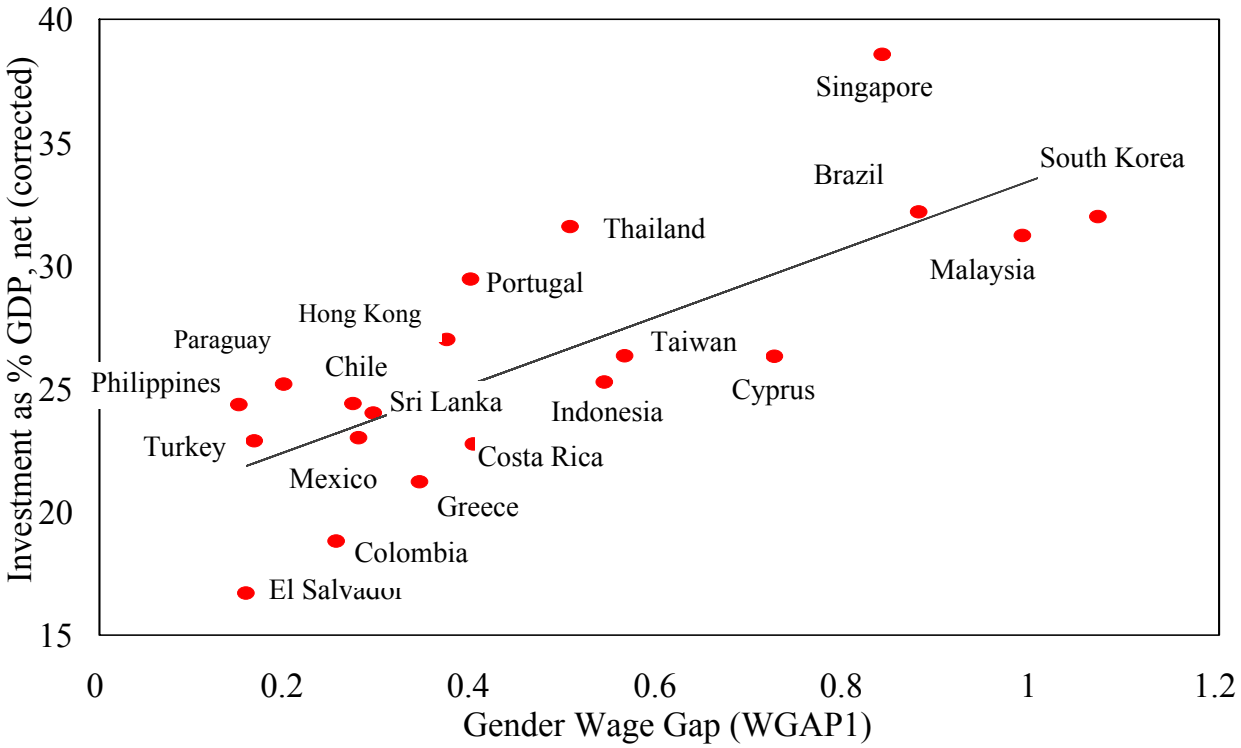


Figure 5.- Gender Earnings Inequality
and Household Income Inequality, 1988

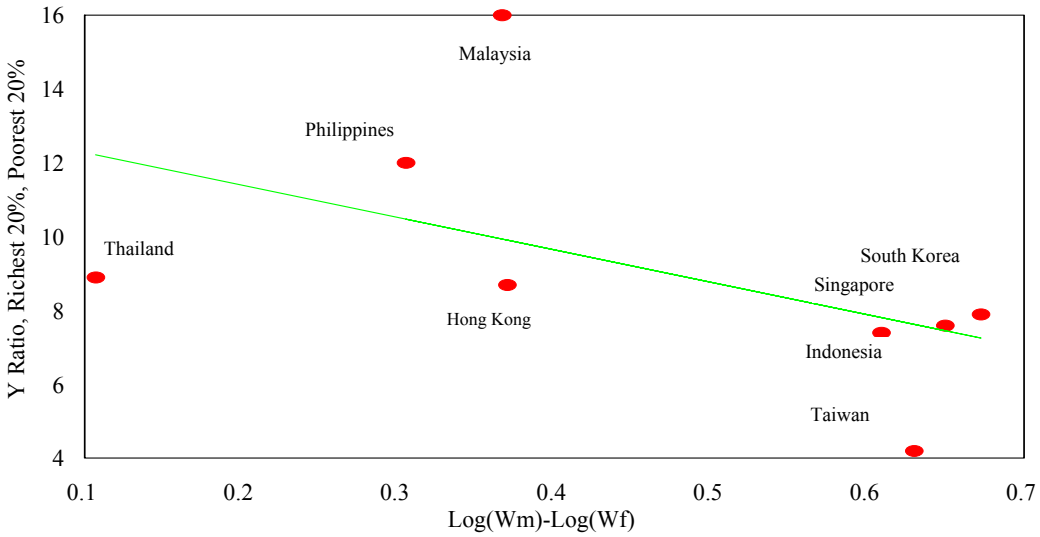


Figure 6: The Growth-Equity Trade-Off

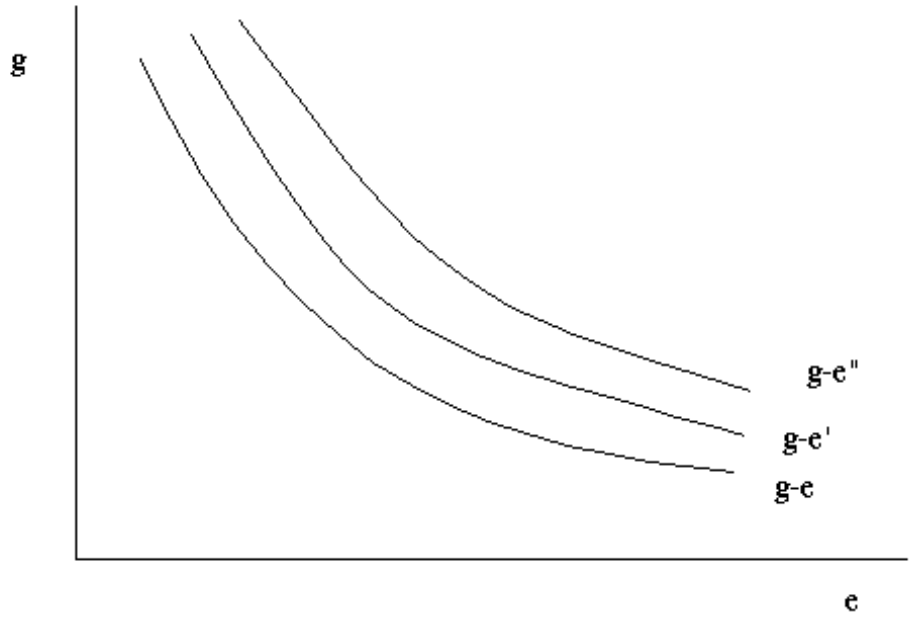


Figure 7: The Growth-Gender Equity Trade-Off

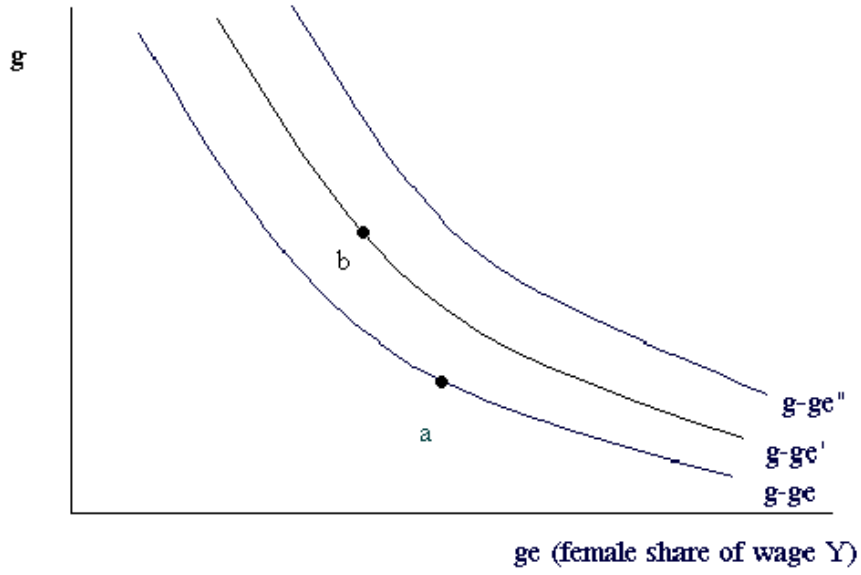


Figure 8.-GDP Growth in East Asia and
Female Share of Mfg. Earnings, 1975-95

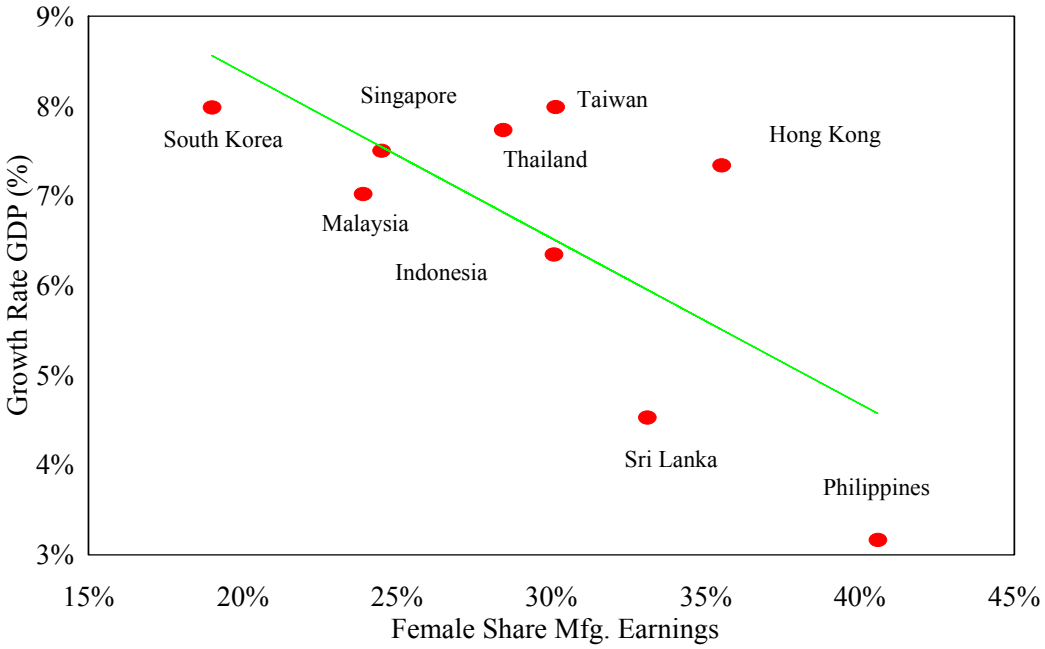
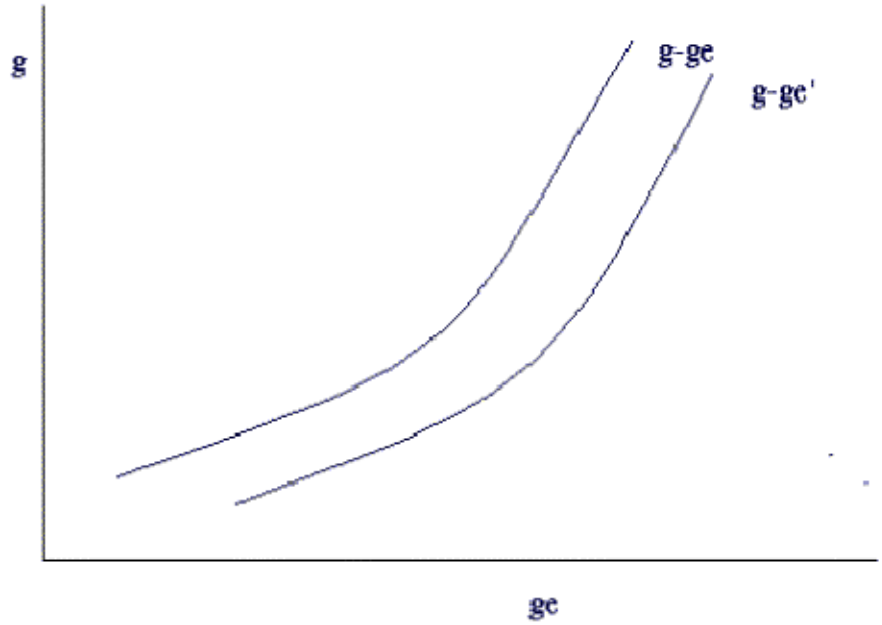


Figure 9: Growth with Gender Equity



Appendix I: Sample Countries and Data Sources

Sample

Brazil	Malaysia
Chile	Mexico
Colombia	Paraguay
Costa Rica	Philippines
Cyprus	Portugal
El Salvador	Singapore
Greece	Sri Lanka
Hong Kong	Taiwan province of China
Indonesia	Thailand
Korea, Rep.	Turkey

Date Sources

Female and male manufacturing earnings: International Labour Organization, Yearbook of Labour Statistics. Exceptions are Indonesia (data are from SAKERNAS); Mexico (see Alarcón and McKinley 1997); and Taiwan province of China, (see DGBAS Yearbook of Labor Statistics, various years) .

GDP in 1985 prices: World Bank World Development Indicators 1997 CD-ROM.

Gross domestic fixed investment (1985 base year): World Bank World Development Indicators 1997 CD-ROM.
Investment share of GPD [%]: Penn World Tables, 5.6.

Income distribution data: World Bank, World Development Report (1989, 1990).

Labor force growth, total, female and male (annual %): World Bank World Development Indicators 1997 CD-ROM.

Macro data for Taiwan province of China: National Income in Taiwan Area of the Republic of China, 1997 and DGBAS.

Education data: Barro and Lee (1996).

Population data: Penn World Tables, 5.6, and for Taiwan province of China, Statistical Yearbook of Republic of China.

Real GDP per capita in constant dollars, chain Index, expressed in international prices, base 1985: Penn World Tables, 5.6.

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Notes

1. For important works in this area, see Alice Amsden (1989) and Robert Wade (1990).

2. By this Amsden is arguing an implicitly positive relationship between income equality (based on high wages) and growth.

3. Indeed, as Helen Hughes (1995) points out in contradiction to the mainstream view, the Philippines is an example of a country in which a free trade stance does not suffice to stimulate growth.

4. In Korea, for example, the strategy included restrictions on foreign direct investment to promote import substitution. This also provided greater flexibility for the state to discipline business and shape private investment decisions.

5. For a review of growth accounting studies, see Jonathan Temple (1999). On the role of capital accumulation in Asia, for example, Alwyn Young (1995), Susan Collins and Barry Bosworth (1996), and Paul Krugman (1994).

6. Some studies present evidence of a more circumscribed relationship between exports and growth. For example, Martine Lussier (1993) found that exports exert a positive effect on growth but notes this holds only for countries that specialize in manufactured rather than primary goods exports. This may be due to the fact that in a semi-industrialized economy, foreign exchange earnings provide access to capital goods and upscale technologies which raise economy-wide productivity, whereas in less industrialized economies foreign exchange is used to purchase finished goods with fewer spillover effects on TFP.

7. Institutional characteristics are measured as: quality of bureaucracy, rule of law, risk of expropriation, and repudiation of contracts by government.

8. Ryan Bishop and Lillian Robinson (1998) indicate that revenues from tourism overtook rice exports as the largest earner of foreign exchange in 1982. Catherine Hill (1993) notes that tourism revenues allow Thailand to meet the interest if not the principal on its foreign debt, permitting Thailand to maintain growth while meeting responsibilities as a debtor nation.

9. These small factories generally employed fewer than thirty persons and as a result, under Taiwan's Standard Labor Law, unionization was not allowed.

10. While the focus here is on the effects of job and wage discrimination, other forms of gender oppression may in the longer run have detrimental effects on growth. For example, limiting women's access to education and their job tenure diminishes incentives for employers to invest in women's training. This may be a self-defeating strategy insofar as countries remain stuck in low value-added goods production and vulnerable to competition from other low-wage sites.

11. See Robert Blecker and Stephanie Seguino (1999), Elissa Braunstein (2000), Korkut Ertürk and Nilüfer Çagatay (1995), and William Darity (1995).

12. For empirical validation of the existence of this causal relationship in Korea, see Seguino (1997b). More broadly, a number of studies note that the larger the percentage of women in an occupation or industry, the lower the average wage.

13. For Figure 2, regression of the growth rate of GDP on the wage gap yielded an R^2 of 0.474 and a t-statistic on the wage gap coefficient of 2.51. For Figure 3, the R^2 is 0.426 and the t-statistic on the independent variable is 2.63.

14. Several additional effects of gender may influence growth that are not addressed here due to data limitations. Human capital formation is assumed to have a positive effect on output growth. Insofar as women face employment discrimination and remain underemployed relative to their skills, however, the growth effects of investing in women's education may be smaller than those for men, indicative of inefficient resource allocation. A degrees of freedom problem resulting from the small sample size, however, forces us to forgo investigation of this variable in order to be able to focus on gender wage effects. (We do, however, indirectly incorporate human capital differences by adjusting wage differentials to reflect educational attainment gaps). Differing saving propensities by gender may matter, but the empirical basis for claims of gender differentiated behavior is thin. For preliminary evidence on this for semi-industrialized economies, see Floro and Seguino (1999).

15. Capital stock data that cover a sufficient number of years are difficult to come by. The weakness with the proxy used in this data set is that it does not account for depreciation. In that way, it overstates the importance of capital. Many studies use instead investment as a share of GDP, but that measure suffers from the same mismeasurement problem. The implications for this study of overstating the growth rate of the capital stock is that the impact of the gender wage gap, via the effect on technical change, may be *under*stated. As a result, the estimated impact of gender wage differentials on growth is likely to be on the conservative side.

16. For more detailed information on the wage data used in this analysis, see International Labour Organization (1995).

17. This may result in measurement error, with women's wages understated if they work fewer hours than men. Average female earnings are, however, also influenced by the coverage of the labor survey. In many cases, establishments with less than 5 workers are excluded from the survey (see note 16 above). Some establishment surveys cover only formal sector or urban workers where earnings tend to be higher. Further, a number of surveys exclude unpaid family workers. These latter characteristics may result in women's average earnings being overstated. There is, unfortunately, insufficient information to determine whether these combined factors lead to systematic over- or underestimation of earnings. Insofar as the measurement errors are random (more likely in the period average estimates), the coefficient estimates on the wage gap variables will be underestimated and the size of the intercept overestimated.

18. Alternative measures of human capital were tried, such as the percentage of persons over 15 having completed secondary education, or stock measures of human capital. In some cases, these were positive and significant, but did not perform robustly in panel data regressions. Results available upon request.

19. Specifically, EDGAP is measured as log(SYRM)! log(SYRF) where SYRM and SYRF are average years of secondary schooling completed by men and women over 15, respectively. These regressions were also run with EDGAP measured using total years of education as well, and with similar results.

20. For a discussion of this model, see Baltagi (1998).

21. One may question the direction of causality between gender wage differentials and growth, especially in countries such as Taiwan and Hong Kong. There, higher female wages led in the early 1990s to declines in labor-intensive manufacturing as firms moved to cheaper wage sites on mainland China. Women's relative wages and/or share of employment in manufacturing, as a result, have fallen. To address this concern, Granger causality tests were run on annual data using the gender wage gap and GDP growth. There was little evidence that GDP growth Granger-caused gender wage differentials for the sample as a whole, but there was evidence that WGAP1 Granger caused GDP growth. Nevertheless, this concern bears further investigation, especially for the earlier industrializers, and is likely to be more fruitfully explored at the country level.

22. The relationship between gender wage differentials and investment is likely to be more complex than the explanation provided here. For example, women's higher labor force participation rates over time may raise economy-wide saving rates, and thus exert a positive effect on investment. The growth of women's participation as paid workers may also signal foreign investors that a country is a profitable investment site. A fuller exploration of the complex relationship between women's labor and aggregate investment remains a topic for future research. The goal here is to assess the data for evidence of an association between investment and gender wage differentials.

23. This observation points to a potential problem of omitted variable bias in the regression results reported in Sections III C. and D. This possibility was explored by controlling for income distribution in the growth regressions using period averages and in the investment regressions. Because income distribution data are intermittent, the five-year average growth equations could not be re-run with an income distribution variable. Income distribution was measured as: 1) Gini coefficients and 2) the ratio of income share of richest to the poorest 20 percent of households. (See Appendix I for data sources). Regressions were run first with the income distribution variables, which had a negative sign and were significant. Then, regressions were run with all control variables including income distribution but without the gender wage gap. Income distribution variables were not significant and signs were not stable. WGAP1 and WGAP2 were then added as explanatory variables and each continued to be positive and significant. Results are available on request.

24. Employer expectations are not always fulfilled, as evidenced by the militancy of female textile workers in Korea in the late 1970s, for example. But there are numerous accounts of the use of male supervisors to monitor female workers as a direct representation of patriarchal relations in the family, in an effort to maintain labor docility in export factories. See, for example, Ching Kwan Lee (1993) and Ok-Jie Lee (1993).