



**Gender, Distribution, and  
Balance of Payments Constrained  
Growth in Developing Countries**

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## Gender, Distribution, and Balance of Payments Constrained Growth in Developing Countries

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*Abstract* An unresolved debate in the development literature concerns the impact of gender inequality on economic growth. Previous studies have found that the effect varies, depending on the measure of inequality (wages or capabilities). This paper expands that discussion by considering both the short- and long-run, evaluating the effects of gender equality in two types of economies—semi-industrialized economies (SIEs) and low-income agricultural economies (LIAEs). Further, it incorporates the effect of gender equity on the balance of payments constraint to growth. These preliminary results suggest that gender equality is more likely to stimulate growth in LIAEs than in SIEs in both the short- and long-run.

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# Gender, Distribution, and Balance of Payments Constrained Growth in Developing Countries

## I. Introduction

A resurgent interest in how distribution affects macroeconomic outcomes is in evidence in policy circles and academia. If a motivation was needed to stimulate exploration of this issue, the global economic slowdown since the 1970s and the sharp increase of income and well-being inequality within and between many countries provided it. In addition to the concern with the social implications of inequality, a driving force of this research agenda is to understand the economy-wide effects of stratification. What is the direction of those effects, and what policies are required to produce a win-win strategy—equity with rising living standards?

A synthesis of endogenous growth theory and the new political economy research addresses these issues, emphasizing the impact of inequality on long-run productivity growth.<sup>1</sup> Post-Keynesian macroeconomists have taken a different tack, emphasizing the role of the class distribution of income in influencing short-run outcomes, with implications for the longer run. The work of Kalecki (1954) and Steindl (1952) was followed by a later generation of economists, including Taylor (1991) Dutt (1984, 1990), and Blecker (1989,1996) in the 1980s and 1990s, who incorporate the role of economic openness into their analyses.

More recently, the degree of gender inequality has surfaced as a distributional variable of interest. This body of research constitutes part of a new subfield of macroeconomics that explores the relationship between macroeconomic outcomes in the short-run, gender inequality, development, and economic growth.<sup>2</sup> Here, too, research advances fall into two categories—post-Keynesian approaches that incorporate demand-side forces and balance of payments constraints, as compared to work done by both mainstream and feminist economists that have a longer-run supply-side focus.

In the former category, the key distributional variable has been the gender wage gap and an important feature of models is the incorporation of the universal tendency towards gendered job segregation (Anker 1998) although the division of labor is understood to vary with a country's economic structure and production mix. In semi-

industrialized economies, for example, female workers are concentrated in tradables industries, primarily producing labor-intensive price- and income-elastic low-cost manufactured goods (Standing 1989, 1999).<sup>3</sup> Conversely, male workers are concentrated in firms producing for the domestic market and in capital-intensive export industries. Higher female wages have been found to negatively affect the balance of payments and short-run growth (Seguino 2000a, 2000b).

In agricultural economies, gendered job segregation takes a different form: women perform the bulk of labor in subsistence production, providing for the family's food needs, while men dominate in cash crop and extractive commodity export production (Darity 1995; Warner and Campbell 2000; Arndt and Tarp 2000).<sup>4</sup> The research finds that gender inequality in access to productive resources in agricultural economies, including land, technical expertise, and inputs hurts agricultural productivity (Udry 1996).

Research exploring the long-run impact of gender equality on growth focuses on capabilities as the measure of gender equality, especially educational equality.<sup>5</sup> These are largely gendered supply-side models, whose theoretical framework has micro-level foundations, in particular empirical research on intrahousehold resource allocation. A fairly consistent finding in that body of work is that due to gender differences in consumption preferences in the household, increases in women's capabilities and control over income (or over resources, more generally) improves outcomes for children (Blumberg 1988; Haddad, Hoddinott, and Alderman 1997). By implication, the quality of the future labor supply is enhanced, a result that can be expected to stimulate long-run growth. More education for women may also lead to higher female labor force participation rates and lower fertility, again with positive effects on investments in children and long-run growth.

The effect of inefficiencies stemming from occupational segregation and job discrimination has also been explored. A broad finding in this literature is that long-run productivity growth is negatively affected by labor market and educational resource misallocation (excess investment in or employment of underqualified males with qualified females overlooked).

This brief discussion underscores that efforts to increase gender equality produce contradictory pressures on growth, and this may account for what appear to be conflicting results in the literature on the role of gender—that gender inequality is either a stimulus or a drag on economic growth. This paper aims at illuminating the various pathways by which gender affects macroeconomic outcomes, paying particular attention to the differential effects of two measures of gender inequality, *access to and control over resources*, measured as wages and, where relevant, resources used in agricultural production versus *capabilities* such as education. The role that economic structure plays in influencing the relationship between macroeconomic outcomes and gender equality in the short- and long-run is considered via a comparison of the case of semi-industrialized economies (SIEs) and low-income agriculturally-dependent economies (LIAEs).

To carry out this task, I first explore short-run demand-side effects, relying on the stylized facts that emerge from the empirical literature to identify the impact of greater gender equality on the various components of aggregate demand. In the subsequent section, I adapt a simple long-run growth model of endogenous output growth to integrate the impact of aggregate demand, gender, and the balance of payments (*BP*) constraint.

The purpose of this paper is not to uncover universal tendencies that gender equality might display in influencing macroeconomic outcomes. Such a goal would be too ambitious. Economies, after all, differ in terms of their structure and institutional context and it would be unrealistic to suggest the existence of ubiquitous laws about the interaction of gender and macroeconomic outcomes that we could deduce, based on the limited time-series data currently available. Rather the goal, more modestly, is to contribute to a typology of the pathways by which gender matters with some tendencies identified based on the empirical literature in how gender matters differently in SIEs and LIAEs. Ultimately, the role that gender plays will differ by country, where structure, institutions, role of external relations (i.e., trade), and the policy environment vary, and indeed, change over time.

To anticipate the results, the critical factors that influence the effect of gender on short- and long-run growth is the sectoral nature of job segregation coupled with the structure of the economy. The effect also crucially depends on whether one is relying on a capabilities measure of inequality or an income measure, such as wages or access to

productive resources. A tendency for gender wage inequality to relax the *BP* constraint in SIEs but exacerbate it in LIAEs is observed, both in the short- and long-run. Conversely, educational inequality slows growth in both SIEs and LIAEs. A cautionary note emerges from the SIE analysis: however desirable gender equality may be, efforts to promote this goal can run into macroeconomic roadblocks. Government policies can attenuate potentially negative effects. This underscores the need for policies aimed at promoting both gender and class equality to be cognizant of the feedback loops between distribution and macroeconomic outcomes.

## II. Gender and Growth: The Short-Run

The conceptual approach and assumptions employed in this paper draw from a stylized reading of the empirical results emerging from the gender and growth literature. As noted, two broad kinds of gender inequality are emphasized: *access to and control over resources*, measured as wages and, in agricultural economies, access to credit, technology, and agricultural inputs and *capabilities*, in particular, education.<sup>6</sup> The channels by which these two categories of variables operate on macroeconomic outcomes are not identical, an issue taken up in more detail below. One reason for this is the variation in the time frame in which their effects are transmitted. Variables affecting access to resources, such as wages (but to a lesser extent credit and technology) are fast-acting variables, with the ability to affect prices and output in the short-run. By contrast, capabilities variables like education that improve labor productivity are likely to produce an impact only with a lag, and in the case of effects on children, a very long lag.

To begin, it is useful to underscore three key features of gendered economic outcomes that appear to be relatively universal to varying degrees. The first is that women on average have less access to and control over material resources than men. Whether we measure this as wages, income, and wealth or as women's share of credit or landholdings, women on average fare worse than men.

Second, there is a sharp gender division of labor with women performing the largest share of unpaid labor (care for children, the sick, and elderly, housework). Within the productive sphere a gender division of labor is widely visible as well. Broadly,

women tend to be in more insecure, low-wage jobs while men are concentrated in higher income jobs with more security and benefits. While job segregation is everywhere apparent, the types of jobs into which women and men are slotted differ by country, and especially by economic structure. In agricultural economies, for example, women's engagement in on-farm agricultural productive activities yields lower income than men's cash crop activities. The gendered distribution of jobs is a major factor influencing gender inequality in income and wages.

Finally, there tend to be gender gaps in education though this is not universally the case. In numerous countries, female educational attainment exceeds males' at some levels (Barro and Lee 2000). Further, although gender educational gaps exist (with substantial variation across countries), most studies find that wage gaps between women and men are at least partially, if not substantially, due to discrimination (Weichselbaumer and Winter-Ebmer 2003).<sup>7</sup> Similarly, women's employment opportunities are circumscribed by gender norms and stereotypes and discriminatory employer behavior.<sup>8</sup> Thus not all inequality can be reduced to insufficient educational investments in females to enhance their skills; wage and income gaps exist between similarly qualified women and men.

What then are the implications of this set of phenomena in SIEs and LIAEs in the short-run, taking into consideration the different structures of these economies? In particular, what is the impact on macroeconomic aggregates—investment, exports, savings, and imports (and by implication, consumption)?

#### *SIEs and gender wage equality in the short-run*

Several stylized characteristics of the structure of SIEs are salient to our analysis. First, semi-industrialized economies have manufacturing capability of goods requiring limited technological know-how. Although they produce manufactured goods, in their efforts to raise productivity and move up the industrial ladder, SIEs rely heavily on imported intermediate inputs and capital goods. Imports are thus price inelastic. As a result of import dependence, these countries face balance of payments constraints to growth. That is, exports play an important role not only in stimulating current demand, but also in

providing the foreign exchange for technological imports that accelerate productivity growth. A feature of many SIEs is that markets tend to be oligopolistic so that pricing can be modeled as a mark-up over prime unit costs.

A distinctive feature of labor markets in SIEs is the concentration of female workers in labor-intensive export manufacturing industries. Women's wages are significantly lower than men's. Educational differences between men and women in SIEs, however, are not as pronounced as in LIAEs. In 1999, for example, the ratio of female to male total years of educational attainment for those 15 and over averaged 92% in SIEs as compared to 65% in LIAEs.<sup>9</sup> Coupling low wages with high educational attainment results in low unit labor costs.

Export manufacturing firms in SIEs, due to limited sunk capital costs and investments in training, tend to be mobile, making these firms more likely to relocate in response to increases in local production costs, e.g., wages. Further, because labor-intensive export goods tend to be relatively homogenous, export demand is price elastic. These effects suggest that higher female wages will have a negative impact on both investment and exports in SIEs (Berik 2000, 2008; Braunstein 2000, 2006; Busse and Spielmann 2006; Osterreich 2007; Seguino 1997;).<sup>10</sup>

What of the impact of greater gender equality on aggregate saving rates? Is there any reason to expect that women and men differ in their saving propensities, such that a redistribution will affect aggregate saving rates? Seguino and Floro (2003) estimate the effect of greater gender equality (measured as relative female/male wages) on aggregate saving in SIEs, controlling for a number of standard variables.<sup>11</sup> The results suggest that a higher female share of wage income (that is, an *intra*class redistribution of income) contributes to an increase in the aggregate saving rate in SIEs.<sup>12</sup> This result may reflect a "life cycle" effect, related to the age composition of female workers in the sample of countries investigated (Ando and Modigliani 1964). In some SIEs, export factory workers are comprised largely of young unmarried women, many of whom save, sending portions of their income home to parents who later employ those funds for sons' education (Greenhalgh 1985; Wolf 1992). This may explain the positive effect on saving of a redistribution to women workers in SIEs, and may not hold for countries in which the age demographic of female workers differs substantially.

With regard to gender differences in the propensity to import, there does not appear to be any empirical work as yet that identifies such effects. Absent hard data, we make some inferences based on the empirical intrahousehold bargaining literature. That body of work finds that women and men have differing consumption preferences, with women tending to spend a larger share of income on basic goods, such as food, health care, and education. Conversely, men tend to spend a larger share of income on luxury goods (Agarwal 1997; Blumberg 1988; Dwyer and Bruce 1988; Haddad, Hodinott, and Alderman 1997). This evidence is surprisingly consistent across economies of different structures and levels of development. Whether men's consumption propensity for luxury goods is also more import-intensive is not yet empirically established. It may be, however, as men's luxury goods increasingly comprise electronics such as cell phones, televisions, and DVD players, in addition to the more typical gambling, cigarettes, and alcohol. A larger share of those goods is most likely imported as compared to women's expenditures on basic goods. This is a tentative suggestion, but the results of the analysis in the following section hold, even if a gender-differentiated propensity to import does not exist.

There are two important points to make about this summary of gender effects on short-run outcomes, via demand-side aggregates. No reference is made to the short-run effects of capabilities equality. This is because, as noted above, such effects may affect labor productivity and thus unit labor costs, but only in the medium- to long-term. Second, we forgo the claim that efficiency wage effects in female-dominated industries exist to such an extent that higher female wages cause unit labor costs fall. Why? First, efficiency wages are generally employed in tasks where it is infeasible to use monitoring and supervision as a means to induce effort on the job such as in skill-intensive production and professional jobs. Monitoring and supervision are not so difficult in female-dominated labor-intensive industries, with the result that efficiency wages in effect are not "needed" to induce effort. Instead, the threat of job loss plays the role of inducing effort, made easier by the fact that women's job opportunities tend to be more limited than men's. Second, even if there were room for efficiency wage gains to induce, for example, quality improvements (as opposed to quantity) that reduce the price elasticity of export demand, firm mobility makes it hard to realize those gains. With

higher wages, firms easily relocate to lower wage sites, or buyers in the global commodity chain source from a lower-wage country. In other words, for efficiency wage gains to provide a solution to the conflict between wages, employment and growth in SIEs, a different institutional context than currently exists is required.<sup>13</sup>

### *Comparative Statics of Gender Equality in SIEs*

To evaluate the effect of greater gender equality on output and employment in the short-run, I utilize the condition for macroeconomic equilibrium in an open economy as a heuristic device to organize our thinking, expressed as:

$$I + P_X X = S + eP_Z^* Z \quad [1]$$

where  $I$  is investment spending (in domestic currency terms),<sup>14</sup>  $P_X$  is the price of export goods,  $X$  is the volume of exports,  $S$  is aggregate saving,  $e$  is the nominal exchange rate,  $P_Z^*$  is the foreign price of imports, and  $Z$  is the volume of imports.<sup>15</sup> For simplicity in this section, we assume a balanced budget, but later in the paper, I consider the role of government in influencing gender equality and thus macroeconomic outcomes. Note that [1] represents the equality of injections and leakages. Any disturbance to the equilibrium condition that causes injections to exceed leakages implies a demand-side stimulus to output and thus an expansion of employment. Such an outcome, should the disturbance be a measure of gender equality, could be labeled “gender cooperative”—an improvement in women’s well-being also potentially benefits men by raising employment.

The gender variable of interest in SIEs in the short-run is wages. The degree of gender wage equality is measured as the ratio of female to male wages:

$$\xi = 0 < \frac{w_F}{w_M} < 1$$

where  $w_F$  and  $w_M$  are average female and male wages, respectively. Women’s low wages relative to men’s are attributed in part to their limited bargaining power in labor markets and segregation in export sector jobs, resulting in significant wage discrimination. Our

strategy will be to sign the derivatives of the variables in [1] with respect to a reduction in gender wage inequality via a rise in the female wage. A higher female wage can be induced by a variety of policies, including an increase in the minimum wage, anti-wage discrimination legislation and enforcement, or other policies that raise women’s bargaining power vis-à-vis employers.<sup>16</sup> Note that greater gender equality could be induced by lowering male wages (or capabilities). However, here and throughout this analysis, we dismiss this route to gender equality as strategically and developmentally undesirable. As such, analysis in this and the following sections holds male measures of wages, access to resources, and capabilities constant. Now, consider the impact of greater gender equality on macroeconomic aggregates.

*Investment* Turning to the first term on the left in [1], the investment function can be written in implicit form as:

$$I = I(w_F, u, q) \quad [2]$$

where  $u$  is the capacity utilization rate, a proxy for aggregate demand measured as:

$$\frac{Y}{Y^P},$$

or the ratio of output to potential (full employment) output; and  $q$  is a proxy for other factors affecting the cost of production.<sup>17</sup> An increase in female wages raises production costs, and can thus lower profits and dampen investment spending. The size of this “profitability” effect, however, depends on women’s share of employment and the “mobility” of the firms that employ women. It will be larger in the export sector in SIEs where firms are more labor-intensive and thus mobile as compared to the domestic goods sector, which is more capital- and skill-intensive. As a result, the response of  $I$  with respect to a change in female wages is negative (an increase in  $q$  have an analogous effect).<sup>18</sup> An increase in capacity utilization is also a stimulus to investment—the “accelerator effect”—whereby firm investment rises as demand increases.

*Exports* Gender wage equality and exports in SIEs are also inversely related, as noted above, because higher female wages raise the price of exports. This can be seen in the following price equation for exports, assuming export industries employ only women and simplifying to exclude intermediate input costs:

$$P_x = \tau[w_F b] \quad [3]$$

where  $P_x$  is the domestic price of exports,  $\tau \geq 1$  is the mark-up over unit costs in the export sector, and  $b$  is the labor coefficient.<sup>19</sup> Export demand is:

$$X = A \left[ \frac{eP_x^*}{P_x} \right]^\psi W^\varepsilon \quad [4]$$

where  $A$  is a constant,  $P_x^*$  is the foreign currency of competing export products from other countries,  $\psi$  is the price elasticity of demand for exports,  $W$  is the level of world income, and  $\varepsilon$  is the (foreign) income elasticity of demand. It is clear from [4] that higher female wages negatively affect export demand.<sup>20</sup> Given the negative effect of female wages on both investment and exports and ignoring for the moment the effects of government spending, higher female wages reduce injections. Now consider the effect of gender on leakages.

*Saving* Turn first to aggregate saving  $S$  in [1]. A simple reduced form saving function can be written as follows:

$$S = S(Y, w_F, \chi) \quad [5]$$

where  $Y$  is income and  $\chi$  is a vector of standard conditioning variables known to affect aggregate saving.<sup>21</sup> Based on the empirical literature for SIEs,

$$\frac{\partial S}{\partial w_F} > 0,$$

*ceteris paribus*. That is, a higher female wage leverages a higher household saving rate. Allowing  $Y$  to vary, however, a higher female wage may induce a contraction ( $Y$  falls) due to the impact on investment and exports. In that case, the negative indirect effect

could swamp the positive direct effect on saving. We assume therefore the net effect of higher female wages on  $S$  is ambiguous.

*Imports* The price of import competing goods has a positive effect on imports. Import competing goods production does not demonstrate the same pattern of gender segregation as export industries; the gender make-up of the labor force varies by industry. Taking this into consideration, the import competing goods price equation is given as:

$$P_z = \mu[\rho w_F + (1 - \rho)w_M]b \quad [6]$$

where  $P_z$  is the price of import-competing goods,  $\mu \geq 0$  is the mark-up over prime unit costs in the import competing goods sector, and  $\rho$  is the female share of employment in that sector. Note that for SIEs, we make the simplifying assumption that  $b = b_x = b_z$ . Incorporating gender effects, the standard import function can be modified as follows:

$$Z = B \left[ \frac{P_z}{eP_z^*} \right]^\eta \left[ \frac{W_M}{W_F} \right]^\omega Y^\sigma \quad [7]$$

where  $B$  is a constant,  $P_z^*$  is the foreign price of imports,  $\eta$  is the price elasticity of imports,  $\omega$  is the elasticity of imports with respect to the gender distribution of income, proxied by the male to female wage ratio, and  $\sigma$  is the income elasticity of import demand. Note that the second term on the right hand side of [7] captures the effect of a gender redistribution on consumption and thus imports. Lacking an empirical basis on which to sign the derivative of imports with respect to the female wage, we can be guided by inferences, based on the impacts noted in the intrahousehold bargaining literature. As discussed, empirical evidence finds that women spend a larger share of income on basic goods and services such as food, health care, and education, which tend to be domestically produced. Men's luxury goods consumption may be more import-intensive in very poor countries, but in SIEs, which do produce some consumer goods, including

electronics, the gap between the male and female propensity to import may be relatively small. For simplicity, then, for SIEs we assume that:

$$Z_{W_F} = 0 .$$

From [1] and the preceding analysis, the impact of higher female wages on macroeconomic aggregates is likely to be as follows, with expected signs below the variables:

$$\begin{array}{cccc} dI + dX < dS + dM & . & & [1'] \\ (-) & (-) & (?) & \end{array}$$

where  $d(\cdot)$  is the total change in the variable with respect to an increase in gender wage equality. As indicated in [1'], an increase in female wages is likely to be contractionary, with leakages exceeding injections. This net effect is attributable to gender segregation, with women in industries in which capital is mobile and exports are price elastic, resulting in a large negative effect of higher female wages on investment and exports. Note that the saving effect is likely to be small, whatever its sign, and not sufficient to outweigh the negative investment and export effects. We assume no impact on imports.

It is quite clear that greater gender wage equality worsens the balance of payments where the *BP* equilibrium is written as:

$$P_X X + F(i) = eP_Z * Z \quad [8]$$

and  $F > 0$  measures capital inflows in domestic currency, a positive function of the domestic interest rate  $i$ . With higher female wages, exports decline and the trade balance deteriorates. Depending on a variety of factors, including the expected rate of export growth and other macroeconomic variables, the trade imbalance may not be sustainable, forcing governments to raise interest rates to attract capital inflows in an effort to rectify *BP* disequilibria.

Figure 1 represents the SIE case in the short-run. The negatively sloped female wage-output curve serves as a modified *IS* function, reflecting the total effect on output of an increase in female wages, shown in [1']. Each point along that curve represents

macroeconomic equilibrium. The  $BP$  constraint is downward sloping,<sup>22</sup> and is more steeply sloped than the  $IS$  curve, consistent with the price elasticity of export demand. The region above and to the right of the  $BP$  function represents a balance of payments deficit and conversely, below and to the left,  $BP$  surplus.

Observe the impact of an increase in female wages from  $w_F^o$  to  $w_F'$  in panel a. Because investment and exports are likely to fall more than saving and imports,  $Y$  declines from  $Y^o$  to  $Y'$ . Equilibrium output and female wages shifts from  $E^o$  to  $E'$ . Even if the  $IS$  curve is steeply sloped (implying female wage increases do not have a strong negative effect on output and employment), the economy moves into a trade imbalance. If rectified by an interest rate hike, the  $BP$  function shifts up to point  $E'$ . However, the  $IS$  curve would then shift left, as investment falls with higher interest rates from equation [2], with the higher female wage leading to a new lower equilibrium level of output (and thus employment) at  $Y''$ , shown in panel b.

[Figure 1 about here].

The potentially negative effect of gender wage equality on the balance of payments, output, and employment is unlikely to be a transitory problem that can easily be elided. Aggregate demand shocks can knock a country off its “normal” long-run growth path, belying the view from some growth theorists that output is trend stationary in the face of demand-side shocks (Dutt and Ros 2007).<sup>23</sup> Thus, even if in the long-run gender wage equality could produce positive supply-side effects on the quality of the labor force, in the short-run, it might induce shocks that drive economies off their long-run paths.

#### *LIAEs and gender wage and resource equality in the short-run*

In LIAEs, the variables presumed to have short-run effects on output, in addition to wages, are several measures of women’s access to resources such as credit, technical assistance, and agricultural inputs. These variables have a positive effect on agricultural productivity (discussed in greater detail below) with consequent price effects.

Capabilities variables, and in particular, education are posited to have an impact on productivity but with a lag, as in SIEs.

For the purposes of this analysis, I take the example of sub-Saharan Africa (SSA). To begin with some stylized observations, LIAEs in SSA are characterized by small manufacturing sectors; agriculture comprises the largest share of value-added in GDP. Exports tend to be extractive commodities and agricultural cash crops such as coffee and cocoa, less price elastic than SIE exports. Further, while import demand for capital goods is rigid, food imports (that are also domestically produced) are somewhat price elastic.<sup>24</sup>

In many SSA economies, men specialize in cash crops and non-tradables goods production (e.g., telecommunications, water, construction). Women are the main providers of the family's food supply, and some supplement their income in the informal sector as petty traders or wage laborers. Unlike SIEs, the export sector is male-dominated in LIAEs. An expanding non-traditional agricultural export (NTAE) sector is changing that, however. The NTAE sector produces specialty crops of fruits and vegetables (e.g., snow peas, baby broccoli, and cut flowers), with women comprising as much as 90 per cent of the workforce in large-scale NTAE enterprises.<sup>25</sup> Nevertheless, the share of NTAEs in exports continues to be quite small.

In contrast to SIEs, the import bill is likely to fall in LIAEs in response to greater female access to resources and higher wages. Numerous micro-level studies find that a redistribution of productive resources to women farmers leads to increases in agricultural productivity and output (for a review, see Blackden and Bhanu 1999). For example, in Burkina Faso, it was found that shifting resources from men's to women's crops could increase output 10-20% (Udry, Hoddinott, Alderman, and Haddad 1995), and in Zambia by 15% (Saito 1994). Similar impacts have been reported for Kenya and Ghana (Saito 1994; Blackden and Bhanu 1999). These are linked to distortion effects whereby women's activities are under-resourced relative to the marginal productivity of female plots as compared to male activities.

Further, Blumberg (1992) finds that when agricultural extension services are extended to women, their yields rise. Rates of adoption of new technologies are gendered, with lower rates for women linked to their lack of complementary resources (Doss 2001, 2006). Greater resource equality could stimulate technology adoption and thus

agricultural productivity. Such an effect would spur food production, driving down domestic food prices, and reduce reliance on food imports.

An indirect effect of women's increased access to resources is the effect on female labor allocation. Women's control over decisions affecting time use depend in part on their bargaining power in the household. Under some circumstances, men may compel women to provide labor on male cash crop fields, despite women's reluctance to do so since men tend to control the proceeds from cash crops. Insofar as higher female wages and bargaining power offer women the leverage to negotiate for more time to spend on their own subsistence crop production, domestic food production rises with consequent price effects that lower import demand.

In addition to the "production effect" of greater female access to resources that dampens import demand, a consumption effect further lowers the import bill. This is because, as noted, higher female wages or access to other resources increases female bargaining power in the household, shifting consumption patterns to basic goods away from luxury goods, some of which are imported. Again, as in the case of SIEs, we do not have direct empirical evidence on this effect; the consumption effect on imports is simply deduced from micro-level analysis of household consumption patterns, coupled with our knowledge of the production structure of LIAEs.

What about gender and saving in SSA? Some evidence suggests that increases in female income stimulates saving. For example, Rotating Savings and Credit Associations (ROSCAs), with women the majority of participants, are purported to increase household savings (Anderson and Baland 2001). In a study using Kenyan household-level data, in contrast, Kiringai (2004) finds that female-headed households have the highest spending multipliers with expenditures concentrated on food. Such contradictory evidence makes it difficult to generalize about gender impacts on saving in LIAEs and for the purposes of this analysis, we assume no correlation.

#### *Comparative statics of greater gender equality in LIAEs*

For LIAEs, I rely again on the macroeconomic equilibrium condition in an open economy as a heuristic device to organize our comparative static analysis as shown in equation [1].

We consider the effect of an increase in wages and improvement in women's access to resources, both of which stimulate agricultural production. Higher wages could be induced by policy changes similar to those identified for SIEs. Access to technical inputs is achieved through increases in government expenditures. Credit access might be expanded by central banks' requirement that some percentage of private bank loan portfolios are to small farmers with the government guaranteeing loans to reduce interest rates. These effects operate differently, so I begin with wages and move to technical assistance and credit for each of the macroeconomic aggregates in [1]. One caveat is noted. Government spending on technical assistance and subsidies for agricultural inputs is an important mechanism to promote gender equality in agriculture. Due to constraints on public spending, however, I assume that any such expenditures must come about through cuts in other areas of public budgets so that again, a balanced budget is assumed.

*Investment* Higher wages and access to resources are likely to produce a negligible effect on investment spending, if any, based on employment patterns. This is because in many SSA countries, large-scale investment (often foreign) is in capital-intensive industries such as telecommunications and infrastructure. These are male-dominated and in any case product demand is less negatively affected by wage increases than in labor-intensive export sectors. In the agricultural sector, increases in women's off farm wages have the potential to be used for on-farm investments. Women have many competing demands for their additional income—school fees, health services, and clothing for children (Verma 2001); the effect on agricultural investment may therefore be limited. However, increases in female access to production credit, technical assistance and agricultural inputs are likely to stimulate on-farm investment. Therefore, greater gender equality via these two channels, especially the latter, is assumed to modestly stimulate investment.

*Exports* Turning to the second term in [1], the derivative of exports with respect to female wages is negative but the size is likely to be small due to the limited role of NTAEs in exports—and certainly much smaller than in SIEs. Increased female access to credit and productive inputs is not likely to affect export production since women's labor is

allocated primarily to domestic food production. Based on the limited available evidence, we posit a small negative effect on exports of greater gender equality.

*Saving* The evidence is far from clear-cut on the effect of increased gender wages and resource equality on aggregate saving in LIAEs. As a result, we assume the net effect is close to zero, whether positive or negative, in the analysis that follows.

*Imports* There are two gender effects on imports. The first is on the price of import-competing goods (the first term on the right in [7], dubbed the “production” effect) and the second is the “consumption” effect, the following term in that equation. Turning first to the “production” effect, we posit, based on the empirical evidence, that the degree of gender equality in access to wages and especially resources has a positive effect on agricultural productivity, thus leading to lower prices on domestically produced food crops. Postulating that only women are employed in this sector for simplicity, the price of LIAE import competing goods can be expressed as:

$$P_z = \mu[w_F b(w_F)] \quad [6']$$

where  $\mu$  is the mark-up over unit costs in the import competing goods sector, and

$$b_{w_F} < 0.$$

In some cases, some women work off farm for wages, and so higher female wages exerts an upward pressure on the price of agricultural goods. We assume, however, the productivity effect (the labor coefficient, falls) dominates the cost effect of higher female wages such that:

$$\frac{dP_z}{dw_F} < 0.$$

The net production effect of greater gender equality is a decline in imports due to the substitution effect as domestic food prices fall. A potential consumption effect—an increase in female income and bargaining power that reduces demand for imported

luxuries as women’s influence over consumption patterns in the household increases—implies a substitution effect in favor of domestic goods and away from imports, further lowering the import bill.<sup>26</sup>

Based on this analysis, we hypothesize the net effects of greater wage and resource equality in LIAEs, using [1]:

$$\begin{array}{cccc} dI + dX > dS + dZ & & & [1''] \\ (+) & (-) & & (-) \end{array}$$

As the inequality in [1''] suggests, a redistribution to women will stimulate investment and reduce exports, although both effects are likely to be small and in any case, work in opposite directions with the result that injections can be assumed to be roughly constant. More importantly, though we cannot infer any effects on saving, imports are likely to fall. The size of that effect may be large enough to produce an economic expansion, stimulating employment in the short-run.

Focusing on the balance of payments in [8], a redistribution to women in SSA may improve the trade balance, and in so doing, reduce the pressure on central banks to raise interest rates in order to attract capital, with falling interest rates stimulating investment and output.

Based on this analysis, Figure 2 below shows positively and steeply sloped *IS* and *BP* curves, reflecting the hypothesized positive effect of greater gender equality on each. For purely illustrative purposes, we assume that gender effects are strongest on *BP*. We represent improvement in women’s income, via higher wages and increased access to resources, with  $w_F$ .

[Figure 2 about here].

Starting from an initial equilibrium at the intersection of the *IS* and *BP* curves at  $E^0$ , a redistribution to women, whether in the form of wages, increased access to credit, or productive inputs raises gender equality from  $w_F^0$  to  $w_F'$ . This produces a demand-side stimulus (leakages fall), and  $Y$  rises from  $Y^0$  to  $Y'$ . Point  $E'$  represents the new higher level

of output consistent with an increase in gender equality and a trade surplus. One possible adjustment (not shown in Figure 2) is a lower interest rate, with  $Y$  shifting right (investment rises) and  $BP$  up to a point at which the  $IS$  and  $BP$  curves intersect at a new higher level of female income and output. This comparative static analysis, based on the stylized facts of the role of gender in LIAEs, implies a win-win outcome of greater equality in contrast to SIEs. (Table A1 summarizes short-run effects of gender equality on growth in SIEs and LIAEs).

### **III. Gender and Long-Run Growth**

A growing body of research identifies the pathways by which gender matters for long-run growth. Perhaps the most consistent finding in the literature is that gender equality stimulates long-run productivity growth, via the effect on the quality of the future labor supply. Elson (1995), Folbre (1994), and others note that traditional growth models treat human resources as non-produced factors of production. The production of labor, however, requires significant investments in material resources and unpaid caring labor, with the latter primarily provided by women. Greater gender equality in capabilities (e.g., education), income and thus bargaining power in the household have been found to have a positive effect on both time and resources invested in children, with subsequent beneficial effects on long-run productivity growth.

Gender wage gaps and access to resources also affect growth via the effects on labor force participation rates and fertility. Cavalcanti and Tavares (2007) model the long-run growth effect of labor market discrimination, positing that the resulting gender wage gap lowers the opportunity cost of unpaid home work and children. Female labor force participation rates are lower, as a result, contributing to a decline of average labor productivity due to selection distortion: the quality of the labor pool is reduced with less qualified males hired in place of more qualified women. With higher fertility, household expenditures per capita rise. Aggregate saving falls along with capital-labor ratios and thus growth (Galor and Weil 19996). The combined effects of gender wage gaps on labor force participation, fertility, and saving result in a decline in economy-wide productivity in the long-run.

Most empirical models that evaluate the long-run effects of gender inequality adopt the neoclassical/endogenous growth model framework (Dollar and Gatti 1999; Knowles, Lorgelly, and Owen 2000; Klasen 2002). For the most part, these emphasize the supply-side. With few exceptions, demand-side problems and balance of payments constraints on growth are not considered.<sup>27</sup> Further, the empirical results that have been published to date rely on differing measures of gender equality—wages versus education—and not surprisingly, arrive at divergent conclusions as to the relationship between gender equality and growth. Knowles, Lorgelly, and Owen (2002) and Klasen (2002), for example, regress GDP growth on gender gaps in education and a set of conditioning variables, and find that a negative effect of educational inequality on per capita growth in the long-run. The logic is again based on a selection distortion argument. Educating more males than females will lower average educational quality, if boys and girls have equal aptitudes.

Other studies find that inequality is a stimulus to growth even in the longer-run, however (Hsiung 1996; Braunstein 2000; Seguino 2000a, 2000b). Using the education-adjusted wage gap as the gender variable, Seguino (2000b) investigates these issues for SIEs, and finds that lower female wages fuel investment and exports, the latter generating the foreign exchange to purchase technology-intensive imports that raise long-run productivity. In a more complicated story, Greenhalgh (1985) argues that low wages for females were a stimulus to male educational attainment in Taiwan, stimulating growth but reinforcing the existing educational gap.

The findings that gender educational equality stimulates growth while wage equality has the reverse effect at first glance appear contradictory. A plausible reconciliation is that greater educational equality raises women's productivity. But substantial social and economic pressures hold down female wage growth, including the mobility of the firms that employ women (Seguino 2006, 2007). Consequently, increases in women's educational attainment may not be compensated in the form of higher wages due to women's lack of bargaining power in the jobs they hold, producing a stimulus to profits and thus investment, and/or a decline in export prices.<sup>28</sup> This is, however, an argument pertaining only to SIEs. (Table A1 summarizes the hypothesized long-run effects of female income and capabilities equality in both SIEs and LIAEs).

An approach that incorporates both of these insights—the potentially negative demand side effect of greater gender wage equality and the more beneficial effects on long-run growth in both SIEs and LIAEs is clearly warranted. The next section develops a long-run growth model that tracks the effects of increases in gender equality in both women’s access to resources *and* capabilities.

### *A Simple Model with Endogenous Productivity Growth*

In response to the absence of long-run growth models that incorporate the effects of the gender distribution of income and education, I construct a simple model, drawing on Palley (2002b) and Setterfield (2006). I begin with a reduced-form Solow equation—but as the reader will see, it is modified to incorporate demand-side effects. In particular, the growth of potential output is endogenously determined by the growth rate of demand.

The long-run growth model is comprised of seven equations. Holding constant male wages, exchange rates, foreign prices and foreign income in order to focus on gender, equations common to both SIEs and LIAEs are:

$$x = -\psi p_x \quad [9]$$

$$z = \eta p_z - \omega w_F + \sigma g \quad [10]$$

$$p_z + x = z \quad [11]$$

$$p_x = p_z = w_F - \beta \quad [12]$$

$$y^P = \lambda + \beta \quad [13]$$

$$\beta = \phi_o + \phi_1 g + \theta'H \quad [14]$$

$$g(w_F) = y^P \quad [15]$$

where lower case letters indicate rates of change. Export growth [9] is derived from [3] and [4], and import growth [10] from [6] and [7]. Equation [11] is the dynamic *BP* constraint.<sup>29</sup> Equation [12] is the growth rate of export and import prices, assumed for simplicity to change at the same rate. The growth rate of potential output,  $y^P$ , is shown in [13] as a positive function of the growth rates of the labor force  $\lambda$  and productivity  $\beta$ .

Productivity growth [14] is a positive function of the growth of (demand-induced) output  $g$  and the quality of the labor supply (human capital), with  $H$  a vector of inputs that increase the efficiency of human capital,  $\theta'$  a vector of coefficients on those inputs, and  $\phi_0$  representing autonomous technical progress. The rate of growth of output  $g$  represents the Verdoorn effect (productivity growth induced by increasing returns) as well as learning-by-doing effects (Amsden 1989). A variety of factors can induce increases in  $H$ , including government expenditures on children's education, extension services, and adult training. Equation [15] imposes the constraint that in the steady state, growth of potential output must equal the growth rate of demand-induced output. Gender equality via effects on wages and access to income produce demand-side effects on  $g$  as described in the previous section, the direction of which is determined by the structure of the economy.

Note that the balance of payments constraint can be rewritten, after substituting [9], [10] and [12] into [11]:

$$-w_F(\psi + \eta - 1 - \omega) + \beta(\psi + \eta - 1) + \sigma g = 0. \quad [11']$$

The first term on the left represents wage effects on exports and imports while the second and third terms capture productivity-induced cost changes that improve the balance of payments. Note that  $(\psi + \eta - 1)$  is the familiar Marshall-Lerner condition.

Gender effects on long-run growth are transmitted through the impact on the size of the labor force (equation [13]) and the quality of the future labor supply and thus productivity (equation [14]). With regard to the first of these, higher female education, wages, and access to resources relative to men's have been found to boost women's participation rates and thus:

$$\lambda_\kappa, \lambda_{w_F} > 0.$$

where  $\kappa$  represents the degree of gender equality in educational attainment, and again,  $w_F$  represents both female wages as well as access to resources.

Gender equality in capabilities, wages, and access to other resources can all be expected to have an unambiguously positive effect on  $H$  in [14]. What factors might induce an increase in  $H$ ? Government expenditures could leverage greater educational

(and other forms of capabilities) equality with positive effects on children. Higher female wages and access to resources that improve women’s household bargaining power are expected to have an analogous effect. As women’s wages rise, families have greater incentive to invest in girls’ education.<sup>30</sup> Thus an increase in both capabilities and income under women’s control can induce higher  $H$ , such that

$$H_{\kappa}, H_{w_F} > 0 .$$

Rewriting [13] to incorporate gender effects on labor force and productivity growth, and thus potential output

$$y^P = \lambda(\kappa, w_F) + \phi_o + \phi_1 g(w_F) + \phi_2 H(\kappa, w_F), \quad [13']$$

we obtain an equation for long-run growth of potential output that depends on the degree of gender equality in two domains—capabilities and income—endogenized to capture demand-side effects. We can now use [13'] to evaluate the effect of gender equality on long-run potential output growth.

#### *Long-run growth of potential output and gender equality in SIEs*

We consider the effect of gender equality in wages and access to resources separately from capabilities. Beginning with wage and resources equality, *ceteris paribus*, from [13'], an improvement in women’s access to income in SIEs has the following effect on the growth rate of potential output with hypothesized signs shown below the respective derivatives:

$$\frac{dy^P}{dw_F} = \left[ \lambda_{w_F} + \phi_1 \frac{\partial g}{\partial w_F} + \phi_2 \frac{\partial H}{\partial w_F} \right].$$

(+)          (−)          (+)

Contradictory forces are clearly at play. Higher relative female wages slow the growth rate of demand-induced output, and of particular importance for productivity growth, investment slows. This effect is offset by the increase in women’s labor force

participation and upgrading of economy-wide human capital. For gender equality to be a stimulus to growth,

$$\phi_1 \frac{\partial g}{\partial w_F} < \frac{\partial \lambda}{\partial w_F} + \phi_2 \frac{\partial H}{\partial w_F} .$$

There is as yet little direct empirical evidence on the relative size of these derivatives. However, in the case of the East Asian economies, given the large share of investment in GDP (around 40%), it may be difficult for productivity gains from gender equality's effects on human capital and the size of the labor force to outweigh the negative effects on investment and thus the rate of growth.

Let us, however, take a more optimistic stance whereby higher female wages have a weak positive effect on potential output. This relationship is shown in Figure 3, where the  $y^P$  curve is steeply and positively sloped. In SIEs,  $g$  is likely to be an inverse function of the female wage, given the strong negative effect on investment and exports. In the steady state, [15] must hold. The intersection of  $g$  and  $y^P$  gives the steady state growth rate,  $g^*$ . The  $BP$  constraint is downward sloping to reflect the negative effect of higher female wages on exports and the fact that imports are rigid.<sup>31</sup> At  $g^*$ , the balance of payment is in equilibrium.

Before analyzing the impact of an exogenous increase in female wages, note that female wages are postulated to adjust as follows:

$$w_F(u) > 0 ,$$

whereby an increase in the rate of capacity utilization drives up the demand for female labor and consequently female wages. An increase in women's wages from  $w_F^o$  to  $w_F'$  stimulates productivity growth, raising potential output. However, at  $w_F'$ ,  $y^P > g$  — there is excess supply (and the hike in female income precipitates a trade imbalance). This provokes a quantity adjustment—utilization rates decline and female wages drop back to  $w_F^o$ .

[Figure 3 about here].

This disappointing tendency in which greater gender wage equality is unsustainable could, however, be offset by government policies to stimulate demand and rectify the trade imbalance—such as public spending on infrastructure and a currency devaluation. Public spending has the benefit of “crowding in” private investment and devaluation could stimulate exports. In that scenario,  $g$  and  $BP$  shift out to the right. The lesson to emphasize is that higher female wages produce subsidiary macroeconomic effects that require some government action in SIEs in order to ensure equity is compatible with growth.

An analogous problem arises if greater gender equality is induced through expansion of female relative capabilities such as education. Potential output increases unambiguously:

$$\frac{dy^P}{d\kappa} = \frac{\partial\lambda}{\partial\kappa} + \phi_2 \frac{\partial H}{\partial\kappa} > 0. .$$

(+)

In this case, the  $y^P$  function in Figure 3 is likely to be flatter, but again, the divergence between supply and demand growth emerges.

*Long-run growth of potential output and gender equality in LIAEs*

In LIAEs, the benefits of gender equality are more certain. Differentiating (13') with respect to  $w_F$  and noting the expected signs, we obtain:

$$\frac{dy^P}{dw_F} = \frac{\partial\lambda}{\partial w_F} + \phi_1 \frac{\partial g}{\partial w_F} + \frac{\partial H}{\partial w_F} .$$

(+)

Here  $\frac{dy^P}{dw_F} > 0$  unambiguously. Greater equality in capabilities produces an analogous positive effect on potential output:

$$\frac{dy^P}{d\kappa} = \frac{\partial \lambda}{\partial \kappa} + \frac{\partial H}{\partial \kappa}.$$

(+)

Graphically, this relationship is shown in Figure 4, with female wages and access to income on the y-axis (we get the same qualitative result with capabilities equality).

[Figure 4 about here].

A difference, as compared to SIEs, is that growth of demand-induced output  $g$  is positively related to improvements in female wages and access to resources as well as capabilities. Note, however, that a similar problem emerges in LIAEs as we observed in SIEs. As gender equality improves, via income or capabilities, only coincidentally will  $g = y^P$ . This is worrisome, since in times of macroeconomic disequilibria, women’s well-being has often served as the “adjusting variable. For example, in some countries, women have borne a disproportionate share of layoffs during contractionary periods. If this also leads to cutbacks in public expenditures in social services, women may bear a disproportionate cost. Their unpaid labor burden tends to rise to compensate at such times, potentially limiting time spent in paid labor. This suggests that the government has an important role to play in taking policy measures that help to ratify greater equality in capabilities and income. In particular, the use of gender-aware monetary policy (including exchange rates) and fiscal policy are required to ensure that growth rates of demand-induced output keep pace with potential output growth.<sup>32</sup>

#### IV. Conclusion

This paper identifies a number of pathways by which gender equality can affect macroeconomic outcomes. The results suggest that more attention should be given to the differential effects of wage and resources on the one hand, and capabilities on the other. Further, approaches that ignore demand-side constraints miss the important potential problem of excess supply (and demand, though that scenario is not considered here). While some theorists argue that prices adjust to equate supply with demand, quantity

adjustments dominate in the models developed here, due to mark-up pricing and fixed coefficients production, whereby female and male workers are not substitutes due to rigid gender norms and stereotypes.

This paper underscores that gender effects are likely to differ by economic structure (that is, production mix of the economy), time frame, gender distribution of labor, and a variety of country-specific institutional factors, making universal claims difficult. The empirical research on the role of gender, while growing rapidly, nevertheless has significant gaps that make it difficult to draw definitive conclusions about the size and direction of effects of gender equality in wages, resources and capabilities on macroeconomic variables. Researchers have been stymied by lack of adequate gender-disaggregated data, a problem that is not likely to be resolved any time soon. That said, the analysis in this paper, the goal of which is to shed some light on the contradictory results of empirical studies on the effects of gender on growth, helps to identify some tendencies in the direction of effects.

Much published research ends with the claim that more research is needed and this paper is no exception. Indeed, although the intent of this work is to unravel the various and sometimes divergent macro pressures that can stymie a “cooperative” gender equality, whereby employment and growth are stimulated as gender wage, resource, and capabilities gaps close, it is likely to have raised more questions than it provided clear-cut answers to. Future research, in addition to expanding our understanding of the effect of greater gender equality on specific macroeconomic aggregates, can usefully address how policy can be used to offset disequilibria that might emerge so that greater gender equality is a win-win strategy for developing countries.

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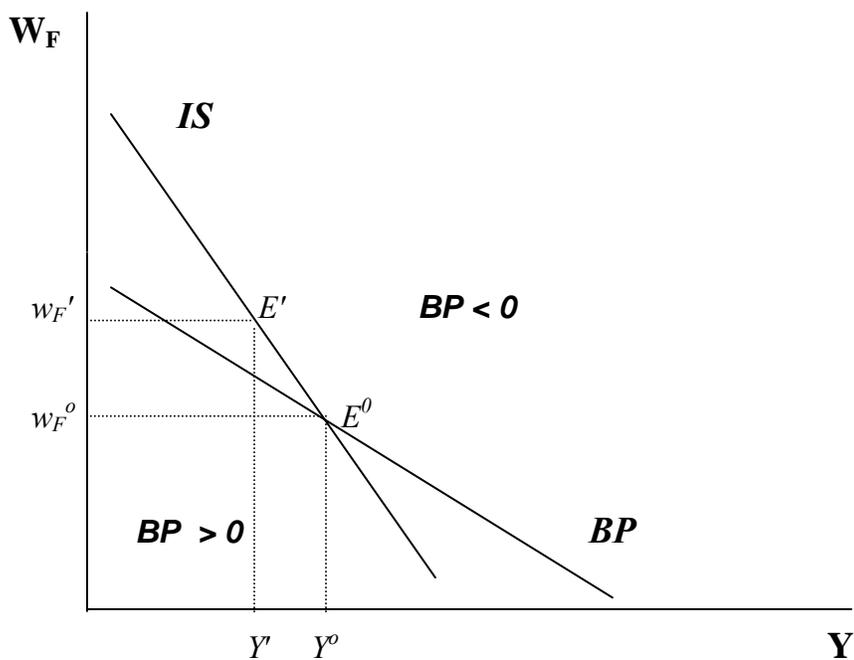
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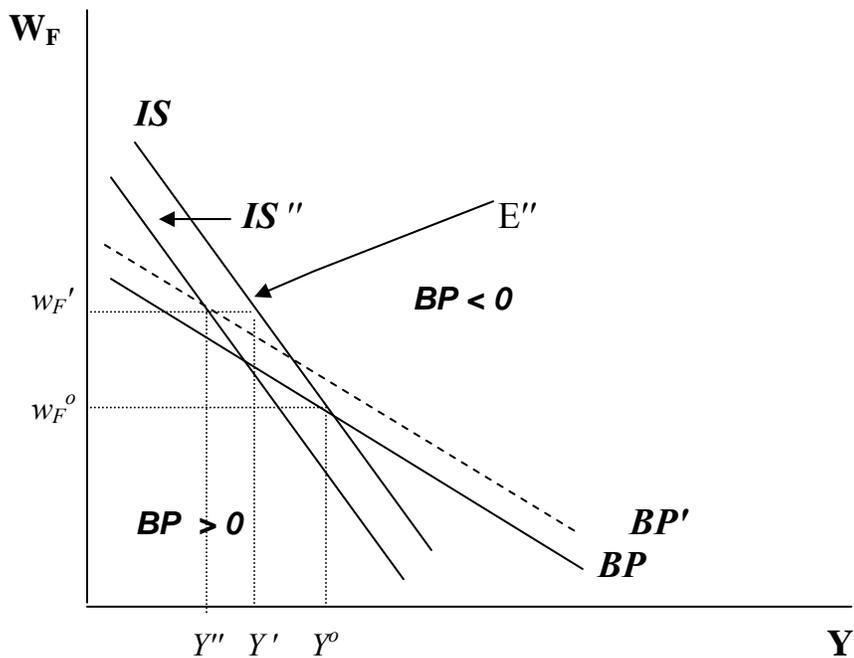
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Panel a.



Panel b.

Figure 1: Gender wage effects on output and the balance of payments in the short-run: The case of SIEs.

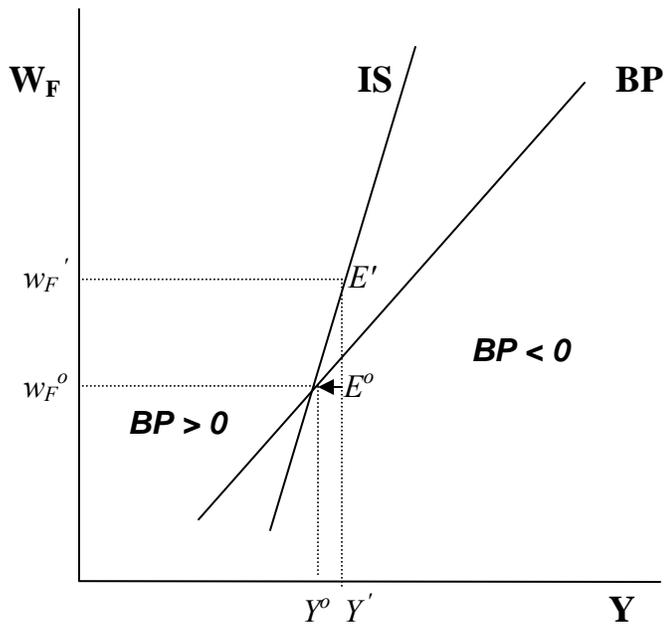


Figure 2: Gender wage and resource effects on output and the balance of payments in the short-run: The case of LIAEs

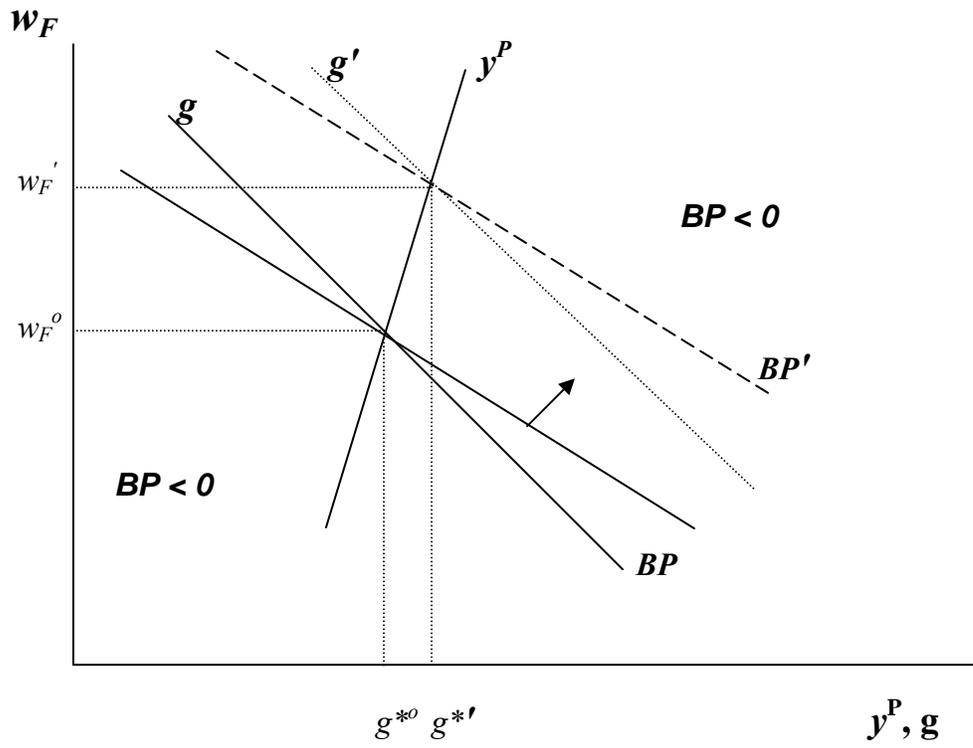


Figure 3. Long-run growth and gender equality in SIEs

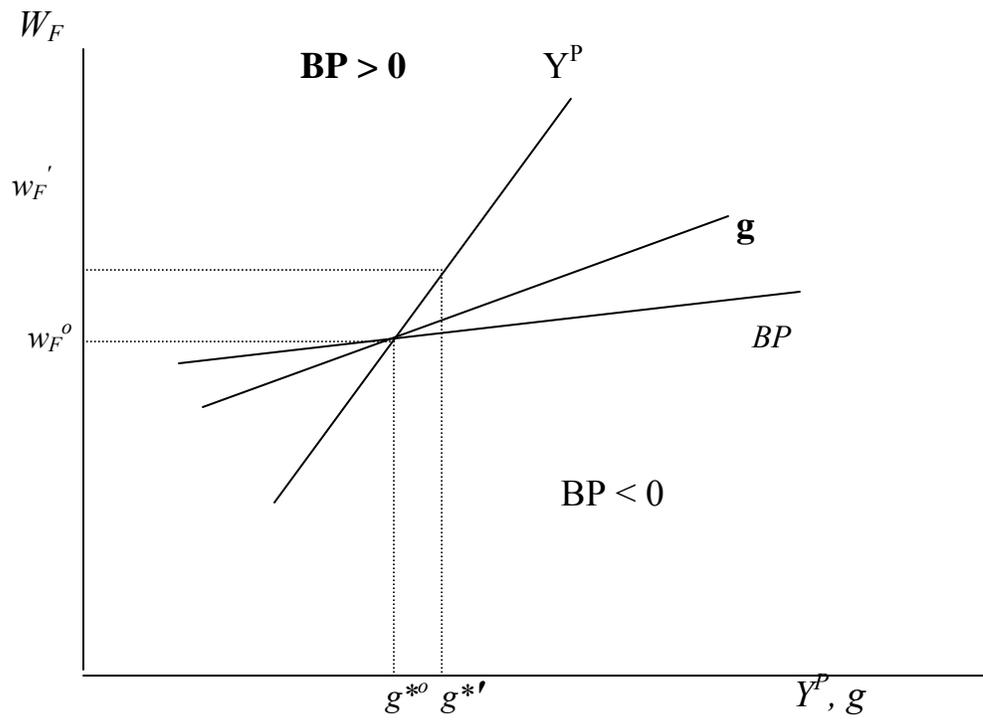


Figure 4. Long-run growth and gender equality in LIAEs.

## APPENDIX

Table A1. Summary of gender equality effects on short- and long-run growth and balance of payments

<i>Gender Equality</i>		SIEs				LIAEs			
		<i>Short-run</i>		<i>Long-run</i>		<i>Short-run</i>		<i>Long-run</i>	
Category	Variable	Output	BP	Output	BP	Output	BP	Output	BP
<i>Access to and control over resources</i>	Wages	–	–	?	?	+	+	+	+
	Credit and Technology	NA	NA	NA	NA	+	+	+	+
<i>Capabilities</i>	Education	0	0	+	+	0	0	+	+

## ENDNOTES

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<sup>1</sup> For a summary of this rich literature see Aghion, Caroli, and García-Peñalosa (1999) and Aghion and Howitt (1997).

<sup>2</sup> Examples of published research in this area include Cagatay and Olzer (1995), Darity (1995), Erturk and Cagatay (1995), Braunstein (2000), Erturk and Darity (2000), Seguino (2000a, 2000b), Fontana and Wood (2000), Blecker and Seguino (2002), Floro and Seguino (2002), and Seguino and Floro (2003).

<sup>3</sup> Significant numbers are employed in the services sector, especially in informal sector jobs that often serve as residual employment. The gender and macroeconomics literature has emphasized manufacturing sector employment, however, because of its role as leading sector and engine of growth in the development process.

<sup>4</sup> This is a stylized fact with some country-specific variations. For example, in a number of sub-Saharan economies, women are now producing non-traditional export crops. Still, revenues from these comprise a relatively small share of total export crop earnings.

<sup>5</sup> See, for example, Hill and King (1995), Knowles, Lorgelly, and Owen (2002), and Klasen (2002).

<sup>6</sup> For extensive summaries of this research, see Fontana and Rodgers (2005), Stotsky (2007), Berik and Rodgers (2008), and Braunstein (2008). The restricted set of gender indicators employed in this paper reflects the emphasis in the literature. These variables are amenable to policy intervention, and can serve to leverage change in other measures of well-being, for example, leisure time, life expectancy, fertility, labor force participation, and maternal mortality rates.

<sup>7</sup> Country studies that assess the portion of gender wage differentials due to discrimination are too numerous to exhaustively inventory here. For some examples, see Birdsall and Behrman (1991), Behrman and Zhang (1995), Horton (1996), and Psacharopoulos and Tzannatos (1992). The latter two studies find that the bulk of gender wage differentials (55 percent in Asia and 75 percent in Latin America) are explained by factors other than human capital differences.

<sup>8</sup> The individual's choice of occupation may be free of pressure or it may be influenced by gender norms and stereotypes. Gender norms carry psychic costs if transgressed, causing women to opt for occupations associated with female qualities that are otherwise lower paid. I construe this as the outcome of a gender stratified system that circumscribes women's job choices. To the extent women's labor is occupationally misallocated relative to aptitudes, there may be negative economy-wide effects on productivity and growth. Boschini (2003) provides a model and empirical assessment of the effect of gender norms and stereotypes on growth.

<sup>9</sup> Though gender educational gaps were wider in previous decades in both SIEs and LIAEs, greater gender equality in education in the sample of current day SIEs was evident even in 1960, with a ratio of 74% as compared to 40% in LIAEs. These ratios are calculated by the author from the Barro and Lee (2000) data.

<sup>10</sup> This is not meant to suggest that labor-intensive exporting firms are attracted solely by low wages since other factors influence investment location decisions. But there is evidence that firm mobility influences the flexibility of investment response to costs. That is, we can expect a larger effect of higher wages on outward investment in labor-intensive industries than those that are capital-intensive.

<sup>11</sup> For two theoretical models of the gender and savings relationship, see Floro and Seguino (2002). One is an individual saving behavior model of non-pooled income households and the second is a Nash bargaining model for pooled-income households. The former highlights the possibility of gender differences in saving rates, due to gender-differentiated income risks. The latter explores the effects of a shift in the distribution of income between women and men on intrahousehold bargaining and thus household saving rates.

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<sup>13</sup> In previous work, I have argued that higher female wages in South Korea had a less negative effect on export growth than in other SIEs. This may have been due to the fact that higher wages there produced strong efficiency wage effects that were made possible by the limited mobility of firms. That is, firm immobility permitted positive productivity effects to emerge as female wages rose, whereas in a context of mobile capital, firm threats to relocate hold wages down, or if wages do rise, firms relocate before productivity effects can be observed (Seguino 2000c, 2007). South Korea's is an example of an institutional context in which efficiency wages could be made operable.

<sup>14</sup> In Blecker and Seguino (2002), investment goods are both produced domestically and imported, a useful complication, but one that I drop here in order to simplify the results, with no great disservice to the comparative static results.

<sup>16</sup> Governments may, for example, uphold the right for workers to organize, a step that would benefit female production workers in export processing zones. Governments might also engage in trade agreements that provide incentives for firms to adhere to labor standards (Berik and Rodgers 2007). Alternatively, governments may enforce anti-discrimination legislation to reduce selection distortion in labor markets, raising both women's wages (since they are often excluded from higher paid jobs) and efficiency. Esteve-Volart (2000) provides empirical evidence of a positive impact on growth in a long-run framework. Because we believe it would take time for government to implement such a directive, we consider this issue to be relevant to the long-run framework discussed in the next section.

<sup>17</sup> Such costs might include interest rates and the exchange rate, the latter affecting the cost of imported intermediate goods.

<sup>18</sup> See also Braunstein (2000) for a Kaleckian macro model that focuses primarily on the relationship between gender wage inequality and foreign direct investment.

<sup>19</sup> The labor coefficient is the inverse of labor productivity. For SIEs, labor productivity is assumed to be exogenous in the short run. In Section III, the economy-wide productivity growth rate is endogenized.

<sup>20</sup> Note also that a fall in female wages and currency devaluation have analogous effects on export demand.

<sup>21</sup> These include the rate of inflation, terms of trade, the age dependency ratio, and the money supply.

<sup>22</sup> The derivation of the slope of the BP curve (not shown here) is obtained by differentiating [8] with respect to  $w_f$ .

<sup>23</sup> Hysteresis effects in labor markets, increasing returns, and balance of payments constraints explain the failure to return to trend growth after a demand-side shock.

<sup>24</sup> Over the last 30 years, population growth has exceeded the growth of agricultural production with the result that in a number of SSA countries, food as a share of imports is relatively constant or rising, and lies between 12-20% for most SSA countries (World Bank 2006).

<sup>25</sup> Garment industries also relied heavily on female labor, but many countries' garment production has precipitously declined with the advent of trade liberalization, with cheaper Asian garments flooding SSA markets (an exception being Mauritius, which has continued to thrive as an exporter of garments).

<sup>26</sup> Increased demand for domestic food will place upward pressure on food prices. Given country-specific differences in elasticities of production and demand, we assume here for simplicity that the net effect of higher female wages on domestic food prices is negative.

<sup>27</sup> Exceptions include Braunstein (2000), Erturk and Cagatay (1995), Erturk and Darity, Seguino (2000a, 2000b), and Blecker and Seguino (2002).

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<sup>28</sup> Evidence for the failure of gender gaps to narrow apace with the closure of educational gaps has shown up in a number of studies on SIEs which find an increase in the discriminatory portion of the wage gap, including China and Vietnam (Liu 2004; Maurer-Fazio, Rawski, and Zhang 1999).

<sup>29</sup> We ignore here the potential of higher interest rates to offset current account deficits by attracting capital inflows, since developing countries with a persistent current account deficit may be perceived as a strong credit risk, making such imbalances unsustainable in a long-run framework.

<sup>30</sup> It should be noted that educational improvements that are not accompanied by higher female wages might not be sustainable. Families may alter investments in girls' education if not ratified by higher female wages. We elide that complication here.

<sup>31</sup> The slope of the curve is:

$$\frac{dg}{dw_F} = \frac{-(\psi + \eta - 1 - \omega)}{\sigma}.$$

<sup>32</sup> For an extensive discussion of gender-equitable macroeconomic policy, see Elson and Cagatay (2000) and Seguino and Grown (2006).