



Macroeconomic Consequences of Cyclical and Secular Changes in Feminization: An Experiment at Gendered Macromodeling

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Summary. — This paper analyzes the macroeconomic implications of cyclical and secular movements in the feminization of the labor force and changes in the intensity of female household labor. We assume that a rise in the feminization of the labor force stimulates investment while a rise in the intensity of female household labor raises savings. We examine the interaction of these two effects in the context of a dynamic Keynesian growth cycle model and assess the likelihood of a structurally adjusting economy experiencing a recovery through feminization. Our analysis shows that for a gender-based recovery to succeed, the impact of feminization of the labor force on investment must be stronger than the impact a rising intensity of female household labor has on savings. Our analysis shows that high and high middle-income countries are more likely to benefit from feminization processes.

1. INTRODUCTION

Structural adjustment processes are generally analyzed in terms of the switches from the nontradables to the tradables sector. Such processes usually entail a gendered restructuring of labor use in the economy. On the one hand, under certain conditions, structural adjustment tends to bring about a feminization of the labor force in the market sphere and, on the other, results in the intensification of female labor use in the reproductive sector.¹ Women usually end up working harder and longer both in the market and in the household. Yet, despite its manifest relevance for social welfare, not to say anything for that of women's, traditional macroeconomic models ignore gendered processes and focus on market activities as the proper sphere of macroeconomic investigation and policy analysis.²

The purpose of this paper is to analyze the macroeconomic implications of cyclical and secular movements in the gender composition (or feminization) of the labor force and changes in the intensity of household labor during periods of structural adjustment that usually coincide with periods of economic contraction. More specifically, we pose the following questions:

(a) What is the macroeconomic impact of feminization of the labor force that results from economic crisis? Does it help an economy get out of

recession? If so, through which mechanisms and under what conditions?

(b) What is the macroeconomic impact of intensification and expansion of reproductive labor during economic crises? Do these processes help bring the economy out of recession or do they exacerbate recessions?

(c) What are the macroeconomic implications of secular changes in the feminization of the labor force?

Our analysis is formulated in the context of a dynamic Keynesian model that draws from the nonlinear theories of the business cycle, similar to those developed by Kalecki, Goodwin and Kaldor, among others.³ We choose to work with this type of a model, as opposed to a more traditional equilibrium one, because it enables us to focus on nonequilibrium processes and to distinguish between slow and fast-acting variables.⁴

The paper is organized into three sections. Section 2 discusses some stylized facts about the gender dimension of economic fluctuations that have emerged in the multifaceted literature on gender. In

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section 3 we develop a general model of growth cycles that incorporates these stylized facts. Though our model is not specifically a model of structural adjustment, we use it to draw conclusions about structurally adjusting economies since adjustment policies are almost invariably put into effect under conditions of economic crisis and carried out during periods of economic contraction.

The generality of the model also allows us to make inferences about economies that are quite different in terms of their level of development. We argue that cyclical and secular changes in the feminization of the labor force and the intensification of women's reproductive labor have effects, respectively, on investment and savings. Analyzing the interaction of these two effects on investment and savings, we specify under what conditions a gender-based recovery is likely to restore growth following periods of structural adjustment. At the end of this section, we broaden our analysis to include the implications of secular changes in feminization of the labor force. Finally in section 4 we reflect on the meaning and relevance of our analytical exercise, discussing our particular conclusions as well as the research questions posed by it. Overall, our discussion suggests that the likelihood of a structurally adjusting economy experiencing a recovery through feminization is proportional to its level of development.

2. SOME STYLIZED FACTS ABOUT FEMINIZATION, LONG-RUN ECONOMIC DEVELOPMENT AND BUSINESS CYCLES

(a) Studies of household survival strategies during periods of structural adjustment suggest that when under economic distress, women members of low-income households respond by increasing their labor force participation rate as well as the hours and intensity of their nonmarket laboring activities. This implies that it is mainly the women who adjust their behavior in an effort to maintain the real consumption level of the household.⁵ This literature also addresses the adverse effects of intensification of work on women. But, though the gender non-neutral welfare consequences of structural adjustment are well recognized, the macro-economic implications of such intensification of women's work have not been systematically studied.

(b) Gender composition of the labor force exhibits great variation across different economies. Various studies have examined the relationship between the degree and changes in the feminization of the labor force and the level of economic development. These have found that the long-term relationship between the female share of the labor force and the level of economic development is

characterized by a U-shaped pattern. During initial stages of economic development, as measured by per capita income, the female share of the labor force falls and then begins to rise after the economy reaches a particular level of industrialization and urbanization. The evidence for this U-shaped pattern can be read both from the historical experiences of industrialized countries and from cross-country econometric analyses which show that the poorest and the richest countries have a high female share of the labor force while middle-income countries tend to be at the bottom of the U.⁶ Moreover, this pattern is related to the long-term structural changes in economies undergoing industrialization and urbanization, the processes that give rise to the U observed with crosscountry data.⁷

(c) Structural adjustment occurs under conditions of economic crisis and is often accompanied by contractionary stabilization policies. In some countries that have gone through structural adjustment, growth rates have been restored after the "lost development decade of the 1980s." In many instances, however, this has been accompanied by rising inequality, poverty and a dramatic drop in urban real wages. In yet other cases (sub-Saharan economies for instance), structural adjustment policies have failed to pave the way for an eventual economic recovery. Standing (1989) has argued that economic restructuring and structural adjustment give rise to a global feminization of the labor force as a result of substitution of women workers for men since women tend to have a lower reservation wage.⁸ Çağatay and Özler (this issue) have found that structural adjustment policies have a positive impact on feminization of the labor force via changes in income distribution, and shifts in outward orientation of the economy. They show that, controlling for long-term factors that give rise to the U pattern such as income per capita and the degree of urbanization, structural adjustment policies have a positive impact on feminization when such policies are accompanied by a reduction in the share of wages in manufacturing value added and by an increase in the ratio of exports to GDP.

(d) Empirical work done in the context of advanced capitalist economies has shown that the evidence on the relationship between cycles and feminization is more complex. In this literature the relationship between the gender composition of labor and business cycles is discussed in terms of three theses: (i) the buffer hypothesis, (ii) the segmentation hypothesis and (iii) the substitution hypothesis. The buffer hypothesis views women as a flexible reserve army of labor whose labor force participation increases during economic upswings and decreases during downturns, giving rise to a procyclical pattern of feminization. The segmentation hypothesis, on the other hand, is based on the

observation that industries and occupations are gendered so that the gender segmentation of labor markets "protects" women from being "last-hired" and "first-fired" as the case would be under the buffer hypothesis. This suggests that the impact of recessions or upswings on the gender composition of the labor force would depend on the compositional changes in industries or occupations that accompany cycles. The substitution hypothesis, in turn, is based on the observation that women become substituted for men workers during downswings as a cost-saving measure because of a gender gap in wages and the low level of union activism and organization among women.⁹

The empirical evidence with regard to these theses is rather mixed. Partial support can be found for all, depending on the cycles that are examined or the segment of women workers whose labor market experience is under scrutiny.¹⁰ It is important to note that due to data availability problems, this literature has focused on industrialized economies. A question that remains is whether the buffer, segmentation or substitution theses would tend to hold more systematically in the context of industrializing economies, particularly those which are undergoing structural adjustment.

Since structural adjustment policies are instituted with the purpose of reorienting an economy toward tradables, we can argue that, at least for some range of industrializing economies, some mixture of either the segmentation or the cyclical substitution hypothesis is likely to hold, resulting in a feminization of the labor force during periods of contraction. Some empirical evidence shows that the traditional manufactured exports of industrializing economies tend to be female-intensive. Examples of such manufacturing industries are textile and apparel, food, etc. Thus, a compositional shift in the economy that is increasing its manufactured exports would tend to advantage women's employment even in a period of high unemployment, simply because of the new compositional effect as long as traditional manufactured exports preserve the same degree of female intensity. Second, in these economies a substitution of women for men might also be in effect since a rise in the share of female workers tends to ameliorate the resistance of labor to contractionary policies associated with structural adjustment. This might be all the more plausible in those countries that are just opening to world markets and thus facing a strong downward pressure on wages.

A more recent literature has focused on the evidence of defeminization processes that set in the more advanced stages of export-oriented growth. Some successful export-oriented economies that reach a more mature stage of development start to produce and export more sophisticated products, abandon the traditional manufactured export mixture and rely

more on nonprice forms of competition. Production of such goods tends to require greater skill, which disadvantages women *vis-à-vis* men workers, and a process entailing substitution of men for women might set in (Benería, 1994; Pearson, 1991; Berik and Çağatay, 1992).¹¹

For the purposes of the model that follows in the next section, we can summarize our discussion of stylized facts by specifying different cases of groups of countries with respect to the cyclical and secular variations in feminization of labor force and in the intensity of women's household work. First is the case of the newly industrializing countries in which feminization of the labor force and the intensity of female household labor seem to exhibit a countercyclical pattern. In this case, the substitution or the segmentation hypothesis (or some combination of the two) is likely to hold. In such cases, we assume that feminization of the labor force takes place during economic contractions and is replaced by a process of defeminization once the economy recovers and growth is restored. Among this group of countries, with respect to the secular pattern of labor force feminization, are three possible cases. Based on the feminization U, we assume that low-middle income countries have a negative, the high-middle income countries a positive, and the middle-income countries a zero secular rate of feminization. We further assume that in all three cases the intensity of female household exhibits no secular trend.

Second, we have the poor countries that are on the upper left segment of the U curve. In this case, there is a negative rate of secular feminization of the labor force, and we assume that no cyclical variation exists. Though little is known about this, it is plausible that in some of the poor sub-Saharan African countries a secular defeminization in the labor force might be associated with a secular increase in the intensity of female household labor. Thus, the intensity of female labor and the feminization of the labor force might possibly be moving in opposite directions.

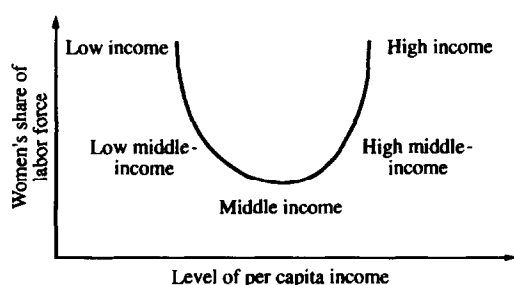
Finally, in the case of the high-income industrialized countries that are on the upper right segment of the U curve, the secular rate of feminization of the labor force is positive. In the case of these countries, it might also be plausible to talk about a long-term, secular tendency of a falling intensity of female household labor. With respect to cyclical variations, though the findings of research on this question are far from being conclusive, it appears that the feminization of the labor force moves procyclically (i.e., the buffer hypothesis holds), while the changes in the intensity of female household labor might still be countercyclical. The assumptions with respect to these different cases are summarized in Table 1.

In our model, we start out with the analytically "simplest" case of middle-income countries that are at the bottom of the U curve (see Figure 1). In section

Table 1. *Summary of assumptions*

Countries by level of income	Secular pattern of feminization of labor force	Cyclical pattern of feminization of labor force	Secular changes in intensity of household labor	Cyclical changes in intensity of household labor
Middle income	0	Countercyclical (substitution or segmentation hypothesis)	0	Countercyclical
Low-middle income	(-)	Countercyclical (substitution or segmentation hypothesis)	0	Countercyclical
High-middle income	(+)	Countercyclical (substitution or segmentation hypothesis)	0	Countercyclical
Low income	(-)	No cyclical variation	0 or (+)	No cyclical variation
High income	(+)	Procyclical (buffer hypothesis)	0 or (-)	Countercyclical

3(b) we extend our discussion to the case of low and high-middle income countries by introducing secular variations in the rate of feminization, and finally end this section by considering the high and low-income countries that are on the upper left and right segments of the U curve.

Figure 1. *Feminization U.*

3. THE MODEL

Here we use a simple Kaldorian model that makes output adjustment (i.e., changes in the rate of capacity utilization rate) a function of the gap between investment and savings. We augment this model by introducing the rate of feminization of the labor force and the intensity of female household labor as separate arguments in, respectively the investment and saving functions. We assume that feminization of the labor force varies countercyclically and is therefore an inverse function of the capacity utilization rate.

We assume that one part of investment demand is induced in the short run by changes in the capacity utilization rate, and the other part is cost-determined in the longer run. Because a higher rate of feminization is associated with lower labor costs and greater control over the labor process by the capitalists, it is positively related to this part of investment demand.

The savings function has as its arguments the rate of capacity utilization and the intensity of household labor. With respect to the former variable, we follow Kaldor in assuming that the propensity to save varies with the level of activity. For intermediate values of the capacity utilization rate, we assume that the propensity to save is less than the propensity to invest. The propensity to save starts to rise, however, and eventually exceeds the propensity to invest at very high rates of capacity utilization as a result of changes in income distribution or bottlenecks of foreign exchange or capacity. Likewise, at very low capacity utilization rates the dissaving rate starts to increase rapidly because of increasing poverty and exceeds the propensity to disinvest.

With respect to the latter variable (the intensity of female household labor)¹² in the savings function, we assume that changes in the relative magnitude of expenditure-saving, nonmarket goods procured in the household in the total consumption basket influence the saving/consumption behavior of households with respect to market goods. The share of nonmarket goods is in turn a function of the intensity of female household work effort and the total female labor time spent for household work.

We assume that both the intensity of female work effort and the length of household female labor are inversely related to household income. Thus, a falling market real wage and total employment implies a rising intensity of female household labor.¹³ This means that as the intensity of work effort and the length of female household labor rises during an economic contraction, *ceteris paribus*, the need for dissaving diminishes as the share of nonmarket, expenditure-saving goods and services in the total consumption basket of the household increases. Likewise, as defeminization occurs during an expansion, both the intensity of household labor and the total female labor in the household diminish, negatively affecting savings.¹⁴ We next summarize our propositions and assumptions formally.

(a) Cyclical behavior

(i) The rate of change in capacity utilization is assumed to be a function of excess demand, i.e., the difference between investment and savings:

$$\dot{u} = \alpha [i(u, f_1) - s(u, f_2)] \quad (1)$$

where u = is the rate of capacity utilization (can be thought of as being measured by the actual output-capital ratio), $i(= I/K)$ is net investment normalized by the size of capital stock, $s(= S/K)$ is savings again normalized by capital stock, α is a positive constant, f_1 stands for the rate of feminization of the labor force and f_2 for the intensity of household labor. I , K and S represent net investment, capital stock and savings respectively. It is assumed that there is no depreciation, or biased technical change, and for simplicity the negative effect of the growth of capital stock on the rate of capacity utilization is ignored. We start out with the assumption that both feminization variables, f_1 and f_2 , move together. Thus, we define a single variable of feminization, f , which is conceptually a composite index of f_1 and f_2 .¹⁵

(ii) Investment is assumed to be a positive and linear function of the rate of capacity utilization and the rate of overall feminization f as defined. That is, $i(u, f) > 0$, where u is defined for $u > 0$, and throughout $i_u > 0$, with $i_{uu} = 0$, $i_{ff} = 0$ and $i_f > 0$.

(iii) The savings function is assumed to be positive and nonlinear in u . $s_u > 0$ throughout, and there exists a u_1 such that $s_{uu} < 0$ when $0 < u < u_1$; and $s_{uu} > 0$ when $u_1 < u$. Moreover, with respect to the impact of feminization on savings, it is assumed that $s_f > 0$, with $s_{ff} = 0$.

(iv) The rate of feminization in turn is given by

$$\dot{f} = \beta(\bar{u} - u), \quad (2)$$

where \bar{u} denotes the *normal* rate of capacity utilization and β is a positive constant. The rate of feminization rises (falls) when the actual capacity utilization rate is below (above) the normal rate of capacity utilization.

(v) At $u = \bar{u}$, there exists a unique equilibrium: $i(u, f) = s(u, f)$, and $\dot{f} = 0$. Around this fixed point it is assumed that $i_u > s_u$.

At this point it might be useful to stop and recapitulate these propositions with the aid of a diagram. As it can be seen in Figure 2, juxtaposing the investment and saving functions yields three positions of equilibrium, of which one in the middle is unstable and the two on the sides are stable. Neither E nor E'' need represent a position of full employment. The highest attainable rate of capacity utilization at E'' might just as well be constrained by foreign exchange or capacity, and in either case it can be associated with a significant amount of unemployment.

Earlier we have remarked that feminization occurs during periods of structural adjustment when the economy is contracting. In the context of our model this implies that as the economy moves toward and settles at the low equilibrium point E' the rate of feminization starts to rise. The increase in the rate of feminization in turn stimulates investment. As a result, the investment schedule starts to shift up and pushes the low equilibrium position E' to the right. By means of simple inspection it can be observed that with a sustained upward shift in the investment schedule, a cumulative process of expansion is bound to take hold. For if it continued to shift up, the investment schedule would eventually detach itself from the saving schedule, obliterating both E' and E , and leaving E'' as the only equilibrium point toward which the economy would gravitate.

The increase in the intensity of female household labor (which moves in tandem with the feminization of the labor force) also has a positive effect on savings. At the bottom of the cycle, if the impact of the increase in the rate of feminization (f) on savings is stronger than its impact on investment, the saving schedule shifts up more than the investment schedule and no recovery can take place. The low equilibrium rate of capacity utilization moves further to the left, and the recession simply deepens.¹⁶

The dynamic properties of the model can be discussed next. Evaluating the Jacobian matrix of the linearized system around the fixed point yields:

$$J_E = \begin{bmatrix} \alpha(i_u - s_u) & \alpha(i_f - s_f) \\ -\beta & 0 \end{bmatrix}$$

which implies that the sum of the two characteristic roots is given by the $\text{tr} J_E = \alpha(i_u - s_u)$, and their product is given by the $|J_E| = \beta\alpha(i_f - s_f)$. The behavior of the dynamic system consisting of equations (1) and (2) depends on the relative magnitude of i_f in relation to s_f . If $i_f < s_f$ then $|J_E| < 0$ and the equilibrium is a saddle point, which means that the system is stable for some

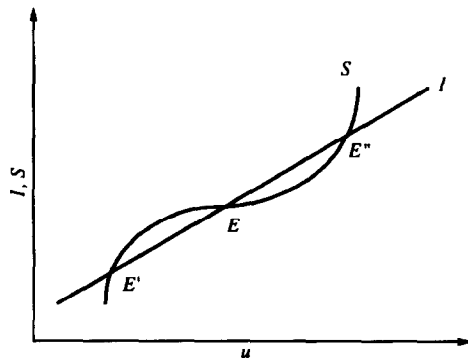


Figure 2. Investment and savings functions.

initial values and unstable for others. In our specific example, the "saddle point" would imply that a rising rate of feminization during an economic contraction only deepens the slump. The other possibility, where $i_t > s_t$ and thus $|J_E| > 0$, is that the system exhibits limit cycles in the variable u around the singular point E .¹⁷ This can be interpreted to imply that increasing feminization during a period of economic contraction can eventually pave the way for a recovery and an expansion. Several extensions can be made without changing the basic structure of our model.

(b) Cyclical behavior and secular variation

We can next extend our discussion to address the implications of secular variations in the rate of feminization of the labor force. Earlier we have remarked that a U-shaped pattern is observed with respect to labor force feminization rates across countries with different levels of per capita income, with poor countries on the left side, rich countries on the right side and middle-income economies at the bottom of the U.

We can for simplicity assume that secular feminization, when not zero, rises (falls) at a constant exponential rate c , between some minimum and maximum value. The time path of secular feminization can then be written as:

$$f(t) = e^{ct} + \bar{f} \quad (3)$$

where the exponential growth rate c can be negative or positive, and \bar{f} is the particular solution which can be interpreted to mean either the "initial" minimum or the maximum level of feminization as to whether c is positive or negative. A differential equation that can generate the time path implied in (3) takes the form:

$$\dot{f} = cf - d \quad (4)$$

where it is defined for the positive interval $f_{\min} < f < f_{\max}$, and $\frac{d}{c} = \bar{f}$. Assuming that the secular and cyclical components of the feminization rate are linearly related to each other, equation (4) can be added to equation (2), to yield:

$$\dot{f} = \beta(\bar{u} - u) + cf - d \quad (5)$$

An evaluation of the Jacobian matrix of the revised dynamic system consisting of equations (1) and (5) enables us to draw some conclusions about the macroeconomic effects of a secular trend in feminization. In the revised system, the sum of the characteristic roots is given by the

$$tr J_E = \alpha(i_u - s_u) + c \quad (6)$$

and their product is now equal to

$$|J_E| = c\alpha(i_u - s_u) + \beta\alpha(i_t - s_t). \quad (7)$$

Provided that c remains smaller than $\alpha(i_u - s_u)$ in absolute value far away from the fixed point, it can be seen that a positive secular rate of feminization enhances the chances of a gender-based recovery. For it is now possible that $|J_E|$ can still be positive even when $s_t > i_t$, because by assumption $(i_u - s_u)$ is always positive around the fixed point, and it is possible that $c(i_u - s_u) > \beta(s_t - i_t)$. Likewise, assuming that c remains smaller than $\alpha(i_u - s_u)$ in absolute value around the fixed point, a negative c reduces the possibility of a limit cycle, for now $|J_E|$ can be negative even when $i_t > s_t$.¹⁸ Furthermore, if there is no secular change in the intensity of household labor as we have assumed, the value of i_t is likely to be bigger (smaller) in relation to that of s_t when c is positive (negative) than what it otherwise would have been had c were equal to zero.

(c) An extension

Earlier we suggested that in the case of poor and rich countries on the upper left and right segments of the U curve, variations in the labor force feminization rate (f_1) and the intensity of household labor (f_2) might not move in tandem. In the case of poor countries we remarked that the secular defeminization of the labor force might be associated with a secular increase in the intensity of household female labor, and that cyclical variations in both variables might be negligible; and, with respect to the rich countries, we suggested that both the secular and cyclical variation in f_1 and f_2 might be in the opposite direction. This means that a positive (negative) secular rate of labor force feminization is accompanied by a secular fall (rise) in the intensity of household female labor in the rich (poor) countries; and, with respect to the cyclical pattern, f_1 moves procyclically, while f_2 is countercyclical in the rich countries, and neither f_1 nor f_2 exhibits cyclical variation in the poor countries.

We can address these two cases in our model by treating the sign of the partial derivative of savings with respect to our composite index of feminization (s_t) in (7) as negative. The rate of feminization of the labor force, f_1 , still moves in tandem with the composite index of feminization f , while the intensity of household labor, f_2 , now moves in the opposite direction.

In the case of poor countries, the cyclical variations are deemed indiscernible, $\beta = 0$, and the secular rate of feminization is negative $c < 0$. This implies that $|J_E| < 0$, and thus the result is definitely a saddle point. The negative sign of s_t plays no role in the outcome. In the case of the rich countries, $\beta < 0$ (the *buffer* hypothesis), $c > 0$ (positive secular rate of feminization), and

$s_t < 0$ (f_1 and f_2 move in opposite directions). Again, the likely outcome is a saddle point. In this case $1/f_t$ can possibly be positive, but since c is likely to be smaller than β and $s_t < 0$ this possibility perhaps can safely be discounted. Thus, in the cases of the poor and the rich countries the likely result is a saddle point: feminization variables tend to make the poor get poorer and the rich richer.¹⁹

4. CONCLUSION

In conclusion, we reflect on the meaning and usefulness of our analytical exercise. Obviously, our model is too simplistic to take literally. There are clearly a host of important variables other than changes in feminization of the labor force, intensity of household labor and capacity utilization rate that influence investment and saving behavior. But, we believe that our model might fulfill a useful function as a heuristic device in summarizing under a coherent framework the various gender-based stylized facts from diverse regions of the world, and help us formulate pertinent research questions.

The main assumptions and conclusions of our exercise can briefly be summarized. We started with the basic assumption that a rise in the feminization of the labor force stimulates investment while a rise in the intensity of female household labor raises savings. Then, we examined the interaction of these two effects in the context of a dynamic growth cycle model, and concluded that rich countries and higher middle-income countries are more likely to economically benefit from the "feminization" variables. Finally, we saw that the introduction of secular changes in the feminization of the labor force into the analysis strengthened this conclusion.

According to our analysis, following a period of structural adjustment, for a gender-based recovery to succeed the positive impact of feminization of the labor force on investment must be stronger than the impact a rising intensity of female household labor has on savings. Taking i_t as given, this implies that,

during a contraction, in those economies where intensity of household labor (f_2) rises faster than the feminization of the labor force (f_1) the likelihood of recovery is less. This might be more likely in those instances where the links of urban working class households to the subsistence economy and the countryside are still relatively strong. This is likely to be the case in low middle-income countries. These are also the countries that exhibit a negative secular rate of feminization, which our analysis suggests decreases the possibility of a successful gender-based recovery. Finally, our exercise also suggested that in the high middle-income countries a gender-based recovery, though its possibility of success is higher, might not last. Export-led growth in these economies might unravel if in its higher stages it unleashes forces that reverse the feminization process experienced during the period of contraction.

We believe, however, that our analysis might be more important for the questions it raises than the particular conclusions it provides. Some of our assumptions are based on well-established stylized facts, while others are plausible guesses based at best on indirect evidence. For instance, the evidence for the feminization U is fairly robust. But, we know much less about the cyclical behavior of feminization of the labor force, especially in the case of developing countries. Beyond a few important case studies, we know even less about what happens to the intensity of household labor during cycles and over the long haul. Again, our assumptions about the positive impact of feminization of the labor force on investment, and that of intensity of household labor on savings are reasonable conjectures based on partial and scattered evidence. The extent to which they find empirical support needs to be studied systematically.

Of course, at a more abstract level, the purpose of this paper has been to come up with an example where gender is a made a part of macroeconomic analysis. We live in a world where gender relations still dictate who bears the burden of economic change and shape how both men and women participate in the economy. The economy is "gender non-neutral", and we are behind the learning curve.

NOTES

1. See Çağatay and Özler (this issue) for a discussion of the conditions under which structural adjustment leads to feminization of the labor force. Throughout this paper, we will use household labor and reproductive labor interchangeably.

2. See Elson (1991), Benería (this issue).

3. For a mathematical reformulation of Kaldor (1940), see Chang and Smyth (1971), and for a general discussion of endogenous trade cycle theories, including that of Kaldor's, see, Gabish and Lorenz (1987, chapter 4).

4. For a broader discussion of the conceptual issues involved in the incorporation of gender into macroeconomic models, see Taylor (this issue), Darity (this issue) and Çağatay, N., C. Grown and D. Elson (this issue).

5. See Benería (1992), Benería and Roldan (1987), Saraceno (1992), Perez-Aleman (1992), Moser (1992), Gonzalez de la Rocha (1988).

6. For the US historical experience, see Goldin (1994). For crosscountry evidence, see Pampel and Tanaka (1986), Goldin (1994), Çağatay and Özler (this issue).

7. See Çağatay and Özler (this issue) for a discussion of what they call the feminization U. Also see, Blau and Ferber (1992) for regional patterns of feminization and defeminization since 1950.

8. Standing's argument is one that encompasses both industrializing as well as industrialized economies. He provides two basic reasons for global feminization. The first is the reduction of wages during structural adjustment in developing countries (and supply-side macroeconomic policies of the 1980s in the advanced countries) which induces an increase in women's labor supply. Second, as a result of rising competitive pressures from increasing internationalization and a shift toward flexible specialization, employers start to substitute women workers for men, resulting in a feminization of the labor force.

9. As pointed out by Humphries and Rubery (1988), there is a disagreement on whether the substitution takes place during a downturn as a result of the more acute pressure on firms to cut costs (Humphries, 1983; Humphries and Rubery, 1988) or during an upswing as a result of the necessary restructuring of the labor process and investment accompanying such substitution (Dex and Perry, 1984; Humphries and Rubery, 1988). Furthermore, there are two possible versions of the substitution thesis: a secular and a cyclical version. According to the secular version, the substitution of women for men workers is not a temporary or reversible phenomenon prompted by a crisis but is an ongoing feature of economic growth. The "global feminization through flexible labor" thesis proposed by Standing (1989) has been interpreted as a variant of this type of secular substitution. According to the cyclical version of the substitution thesis, one would expect to see a "reverse reserve army of labor" mechanism, or alternatively stated, a counter-cyclical pattern of feminization of the labor force.

10. See Rubery (1988), Humphries and Rubery (1988), Bakker (1988), Milkman (1987), Van Wagner (1993), Figart and Mutari (1993).

11. The substitution need not be a direct process of substitution but can be an indirect one. Also see Berik (1995).

12. We interpret that broadly to include women's work load as determined by both its length and intensity of effort.

13. Furthermore, during a contraction, the level of female employment is likely to fall along with male employment, and the rate of feminization of the labor force increases because male employment falls more than female employment. Thus, even with a rising rate of feminization of the labor force, in the aggregate, the relative magnitude of female employment outside the household in relation to the total female labor is likely to diminish, which is to say that overall female labor hours in the household tend to rise.

14. We assume that, during contractions, as a result of gender relations which assign household work largely to women, men do not increase and/or intensify their household labor by any significant magnitude.

15. For our purposes, expressing one in terms of the other variable of feminization could work equally well.

16. As we shall later see, the secular feminization rate can play an important role at this point. It is possible that if this rate is positive, within a margin we specify below, a recovery can still take hold even if the impact of the rate of cyclical feminization on savings is stronger than its impact on investment.

17. We show this in the appendix.

18. If $c > \alpha(i_u - s_u)$ throughout in absolute value and $|J_E| > 0$, then the fixed point becomes an unstable node when $c > 0$, and a stable node when $c < 0$. But because secular changes in the feminization of the labor force are slow neither possibility is likely. Thus, in this and the next section we assume that $c < \alpha(i_u - s_u)$ in absolute value throughout.

19. This is what Taylor (this issue) calls a "win-win or lose-lose" situation.

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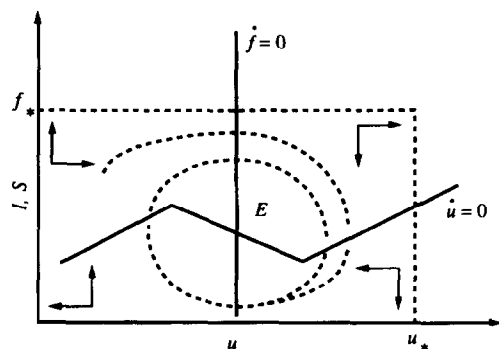
APPENDIX

That the dynamic system given by equations (1) and (2) generates limit cycles under the said assumptions can be shown by constructing the phase diagram of the system. The slope of the locus $\dot{u} = 0$ in the $f-u$ plane is given by

$$\left. \frac{df}{du} \right|_{\dot{u}=0} = \frac{s_u - i_u}{i_f - s_f}.$$

The denominator is always positive by assumption, and the numerator changes its sign according to the sign of $(s_u - i_u)$, which according to our earlier assumption, is negative for intermediate values of u and positive for very high and low values of u . This implies that the slope of the $\dot{u} = 0$ locus is positive away from equilibrium and negative around it. The locus of $\dot{f} = 0$ is simply the vertical line $u = \bar{u}$. In Figure A1, we plot the $\dot{u} = 0$ and $\dot{f} = 0$ locuses, and examine the trajectories of motion. A simple inspection of the Jacobian matrix shows that for any point that lies above the $\dot{u} = 0$ curve, $du/dt > 0$, and negative for any point below it. At any point to the left of $\dot{f} = 0$ locus, $df/dt > 0$, and negative at any point to its right.

If we denote the compact set D as the set $\{(u, f) | 0 < u \leq u_*, 0 < f \leq f_*\}$ then any positive semi-orbit in R starting outside D will eventually enter D . This can be seen by examining the



direction of movement in each of the four regions in Figure A1 created by the intersection of the $\dot{u} = 0$ and $\dot{f} = 0$ curves. A trajectory that starts in the region above $\dot{u} = 0$ locus and to the right $\dot{f} = 0$ locus but outside D moves southeast and enters D in the region to the right of $\dot{f} = 0$ curve and below $\dot{u} = 0$, where it moves in the southwest direction. Since a trajectory once in it cannot exit D , and the only singular point in the bounded region D is shown to be unstable, by the Poincaré-Bendixon theorem there exists in D at least one attracting closed orbit.