

MACROECONOMIC INFLUENCES ON FEMALE LABOR FORCE PARTICIPATION: THE LATIN AMERICAN EVIDENCE

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ABSTRACT

Female labor force participation has increased significantly in Latin America during the last two decades, a period which was also characterized by large fluctuations in aggregate economic activity. The particular question that this paper focuses on is: How do macroeconomic conditions affect female labor market experiences? Two distinct macroeconomic influences are analyzed: the change in the structural composition of employment between sectors, particularly the rising share of the services sector, and the business cycle, captured by deviations of output from trend and by the rate of unemployment.

Part of the rising female share in total employment can be explained by increases in the importance of sectors which tend to employ relatively more women, particularly services, but the lion's share of the explanation is found in increases in the proportion of women employed within each sector. As to the cyclical patterns, the evidence indicates that, after controlling for other relevant variables, female labor force participation increased during recessions among a) relatively low income countries and b) households where the spouse was unemployed.

SÍNTESIS

La participación femenina en la fuerza de trabajo ha aumentado significativamente en Latinoamérica durante las últimas dos décadas, un período que se caracteriza también por grandes fluctuaciones en la actividad económica agregada. Este trabajo aborda la interrogante: ¿Cómo las influencias macroeconómicas gravitan sobre las experiencias del mercado laboral femenino? Se analizan dos influencias macroeconómicas distintas: el cambio en la composición estructural del empleo entre los sectores, en particular la participación cada vez mayor del sector servicios, y el ciclo económico, capturado por desviaciones de la producción respecto de la tendencia y por la tasa de desempleo.

Una proporción de la mayor participación de la mujer en el empleo total puede explicarse por aumentos en la importancia de los sectores que tienden a contratar un número relativamente mayor de mujeres, en especial, los servicios; pero, la parte del león de la explicación se la lleva el aumento de la proporción de mujeres empleadas en cada sector. En cuanto a los esquemas cíclicos, la evidencia indica que, después de haber controlado por otras variables relevantes, la participación de la mujer en la fuerza laboral aumentó durante las recesiones entre a) países de ingresos relativamente bajos y b) hogares en que el cónyuge está cesante.

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1. INTRODUCTION

Female labor force participation rates have increased significantly in Latin America during the last two decades. Psacharopoulos and Tzannatos (1992) emphasize that the observed increase has been driven by a large increase in participation among prime-aged women, along with a typical reduction in participation for younger (below 20) and older (above 60) women. Overall participation rates still exhibit large variations across countries. In fact, according to the most current data reported in Table 1, female labor force participation rates in Latin American countries range between about 25 and 50 percent of the female working age population. These rates are still substantially lower than those of developed countries (female participation rates are about 60 percent in OECD countries and 66 percent in North America), but they have moved closer to each other and closer to those of more developed countries.

This paper analyzes the relationship between female participation rates and the supply and demand conditions that explain their increase. While the previous literature has focused primarily on supply side factors and has examined cross-section data, this paper extends the focus to include the effects of changing demand through time and attempts to reconcile the cross-section results with the time trends. A better understanding of the determinants of female labor force participation in the context of developing countries is important for the following reasons: (1) given the relatively low participation rates, there is plenty of room for rapid incorporation of women into the labor force; (2) female labor force participation response is a key consideration in the design of poverty alleviation programs that have 'emergency employment components'; and (3) female labor force participation response is an important factor in predicting the impacts of unexpected changes in labor demand or supply.

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Studies based on cross-section data for various countries have highlighted the importance of education and family status (marital status, children, etc.) as determinants of female labor force participation in Latin America.¹ An extrapolation of these cross-section results to explain the time trend would imply that women's labor force participation has responded to rising levels of female education and to increases in the availability of birth control.

TABLE 1

PARTICIPATION RATE OF THE FEMALE LABOR FORCE
(Women over 15 years of age)

Country	Early Years	Later Year	Labor Force circa 1970	Participation Rate circa 1990
Argentina	1970	1989	26,5	29,1
Bolivia	1980	1989	23,0	24,2
Brazil	1973	1988	37,2	43,3
Colombia	1973	1990	23,9	45,7
Costa Rica	1973	1990	20,1	32,5
Cuba	1970	1988	18,3	41,2
Chile	1970	1990	21,2	31,8
Ecuador	1974	1990	16,6	32,7
El Salvador	1971	1990	32,2	51,0
Guatemala	1973	1989	14,3	28,4
Haiti	1970	1990	70,3	49,0
Jamaica	1970	1988	62,0*	47,0*
Mexico	1970	1988	18,5	35,1
Nicaragua	1971	1985	20,6	39,3
Panama	1970	1989	30,3	37,9
Paraguay	1972	1990	23,1	49,7
Peru	1972	1989	19,9	48,2
Puerto Rico	1976	1989	26,9**	31,4**
Venezuela	1971	1989	28,9	34,8
Mean	28,1	38,5		
Std. Dev.	14,6	8,2		

* Women over 14 years of age.

** Women over 16 years of age.

Source: International Labour Organization, (1991,1976).

¹ See for example Castañeda (1981) and, more recently, Psacharopoulos and Tzannatos (1991).

More recently, attention has turned to labor demand conditions. For example, Horton's (1990) paper on Bolivia provides evidence that women's labor force participation rates declined during the 1982 recession. She notes an important change in employment allocation: while agriculture employment shares fell during the seventies, they saw an increase during the eighties. Uthoff and Pollack (1985) and Gindling (1990) studied the adjustment of the Costa Rican labor market to the 1979-1982 crisis. Uthoff and Pollack (1985) identified differences in the fall of real wages across sectors during recessions, looking separately at the experiences of males and females. They found that women as a group suffered the largest reduction in real wages. However, when they control for skill composition, they found that the real wage reductions were the same for men and women. Gindling (1990) argues that during the 1979-82 recession there was an influx of less educated women into the labor force, as declining real incomes forced secondary workers into the market.

Garcia and Gomariz (1989) report the evolution of women's labor force participation in Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua. The data analyses suggest that female labor force participation has increased faster in Costa Rica, El Salvador and Nicaragua than in Guatemala and Honduras. Obviously, there is an important difference between El Salvador and Nicaragua and the rest of Central America. The first two countries have experienced profound military conflicts. These led to large migration outflows which have affected women's labor force participation significantly. In a study of the relationship between outmigration and economic adjustment, Funkhouser (1990) recognizes that outmigration affects labor force participation through two mechanisms. Family members working abroad (particularly in the United States) send part of their salaries to their families in El Salvador, and these funds represent a significant increase in income for these Salvadoran families. Outmigration also reduces labor supply in El Salvador, having a positive impact on labor market opportunities for those remaining in the country. Funkhouser (1990) concludes that, although remittances have a negative impact on labor force participation in El Salvador, the positive effect of outmigration dominates, resulting in an increase in women's labor force participation. He also concludes that outmigration explains the low levels of unemployment observed during the declining period of the eighties.

A recent study by Psacharopoulos and Tzannatos (1992) analyzes trends in female labor force participation in 15 Latin American countries and concludes: "The increase in female participation in the region was somewhat unexpected given the experience of industrialized countries. The latter saw a rise in female participation during periods of consistent economic growth and tight labor market conditions. In contrast, the sizable increase in female participation in Latin America occurred in a period of adverse economic conditions." (p.4).

The large macroeconomic cycles experienced by Latin American countries in the seventies and eighties provide a unique opportunity to examine their influence on women's labor market experiences. In this paper we use three different data sources to examine the effect of macroeconomic conditions on female labor market experience. First, we use ILO data to examine the impact of compositional changes in employment on women's employment by country. Second, based on World Bank data we do a time-series/cross-section analysis of women's labor force participation, paying special attention to the effects of cyclical swings in economic activity. Finally, we use annual survey data extending from 1974 to 1987 for the largest metropolitan area of Chile (Greater Santiago) to examine the impact of macroeconomic variables on participation and employment probabilities, controlling for other determinants of participation at the individual level.

The advantage of using three alternative data sources is that it allows us to check for the robustness of the results, both across countries and across periods. This is particularly important since data for Latin American countries are often of questionable quality. As a result, econometric findings based on only a single data source are often suspect.

2.1. Effects of Changes in the Sectoral Composition of Employment

Aggregate employment data provide some insight into the effects of medium-term changes in macroeconomic conditions on women's employment opportunities. As is true for most of the world, women's share of employment has been increasing in recent years in Latin America. In order to understand the reasons behind this growth, it is useful to decompose the growth into two components.

First, women's share of total employment changes if the sectors which tend to employ women expand or contract. This can be thought of as the effect of changes in aggregate demand on women's employment and it is clearly related to the development process and structural adjustment. To take an obvious example, as a country develops, the employment share of the agricultural sector is likely to decline as its manufacturing and service sectors expand. If, as is true in some countries, women make up a disproportionately small share of the agricultural sector and disproportionately large shares of the latter two sectors there is likely to be an increase in female employment as the country develops.

The second component to changes in women's share of total employment consists of changes in the proportion of employees in each sector that are women. That is, holding constant the sectoral composition of employment, women's participation in individual sectors can vary. Perceptions about women's role in society are changing, along with women's access to education, employment and

birth control. As barriers to employment drop, women around the world have been increasing their labor force participation rates. This trend has been observed in both developing and developed countries.

We can express this decomposition algebraically. Let WE_j represent female employment in sector j , TE_j represent total employment in sector j , WE represent total female employment and TE total employment. Then the age of the work force that is female can be expressed as

$$\frac{WE}{TE} = \sum_j \frac{WE_j}{TE_j} \frac{TE_j}{TE} \quad (1)$$

or

$$w = \sum w_j s_j \quad (2)$$

where w represents the age of the work force that is female, w_j represents the percentage of sector j employment that is female and s_j represents sector j 's share of total employment. Then, the change in women's share of total employment can be decomposed as follows:

$$\Delta w = \sum_j w_j \Delta s_j + \sum_j s_j \Delta w_j + \sum_j \Delta w_j \Delta s_j \quad (3)$$

This decomposition relates to the foregoing discussion. The first term represents changes in women's share of total employment that can be attributed to changes in the structural composition of employment. In a sense, it shows the changes due to macroeconomic forces or to changes in demand for final output. The second term describes the effect of within-sector changes in the male/female ratio, holding constant the sectoral composition of total employment. This term captures the effect (if any) of increasing reliance on flexible labor as well as the global trend toward increased female labor force participation. The third term is the product of changes in two ratios and is typically small.

Table 2 shows the value of each term in equation (3) for ten Latin American countries. The employment data on which this table is based are from the ILO *Yearbook of Labour Statistics*. All Latin American countries for which the *Yearbook of Labour Statistics* reports employment by sector by sex for at least six years are included in Table 2. Since the time span covered varies by country, the figures in the table are reported on an annual basis.

The first thing to notice about Table 2 is that, with the exception of Haiti, women's employment as a share of total employment has grown in recent years

(column 4). This comes as no surprise, and is consistent with trends outside of Latin America. Women's share of employment is growing rapidly in Brazil and Cuba.

However, with the exceptions of these two and of Haiti, the changes in women's share of total employment are fairly similar across countries, ranging between .20 and .48 percent per year.

TABLE 2
CHANGES IN WOMEN'S SHARE OF TOTAL EMPLOYMENT
(Average Annual Rates of Change)

COUNTRY	YEARS	w1*Δs (1)	s1*Δw (2)	Δs*Δw (3)	TOTAL (4)	(2)/(1) (5)
Bolivia	1978-87	0.0009	0.0018	0.0001	0.0028	2.0498
Brazil	1970-85	0.0004	0.0068	0.0033	0.0106	15.814
Chile	1974-87	0.0015	0.0027	0.0001	0.0043	1.8138
Colombia	1975-87	-0.0008	0.0031	0.0005	0.0027	3.6394
Costa Rica	1980-86	0.0032	0.0010	-0.0000	0.0042	0.3130
Cuba	1978-86	0.0024	0.0077	-0.0001	0.0100	3.1866
Haiti	1970-83	0.0018	-0.0062	0.0005	-0.0039	3.5196
Puerto Rico	1978-87	0.0011	0.0035	0.0002	0.0048	3.2710
Panama	1974-87	0.0020	0.0017	-0.0001	0.0036	0.8519
Venezuela	1981-87	0.0013	0.0007	0.0000	0.0020	0.5909
mean		0.0014	0.0023	0.0005	0.0041	3.5050
std. dev.		0.0011	0.0038	0.0010	0.0041	4.5016
Canada	1978-87	0.0017	0.0036	-0.0000	0.0054	2.0869
Japan	1976-87	0.0002	0.0020	0.0001	0.0024	8.2896
United Kng.	1975-87	0.0024	0.0013	-0.0001	0.0036	0.5569
United St.	1978-87	0.0011	0.0029	0.0001	0.0040	2.6888
mean		0.0014	0.0025	0.0000	0.0039	3.4056
std. dev.		0.0009	0.0010	0.0001	0.0012	3.3774

Source: Calculated from employment data reported in the ILO *Yearbook Labour Statistics* and from the University of Chile Employment Surveys.

In most of these countries, the male labor force participation rate has been decreasing over the period in question, while the female labor force participation rate has been increasing.² In the case of Haiti, however, both male and female

² See ILO, *Yearbook of Labour Statistics*.

participation rates declined in recent years. Schultz (1990) reports important differences in the direction of change in women's labor force role as income per capita increases among the Asian, Latin American and African regions. "It is not surprising, therefore, that there is no consensus on trends associated with development in women's labor force participation." (p 460) In fact, the trend in Haiti, which is less developed and has a population that is less educated than the other Latin American countries, is very similar to the female labor force participation patterns throughout most of Africa during this period.

We turn now to the decomposition of these changes and look first at column 1. Column 1 represents the changes in women's share of employment that can be attributed to changes in the relative importance of various sectors of the economy. In nine of the ten countries considered, sectoral shifts have had positive effects on female employment. The primary reason for this is that, in most of these countries, the service sectors showed relative employment gains, and women are disproportionately represented in the service sectors. In particular, of the ten sectors identified by the ILO, four showed employment growth during the periods covered. These were community, social and personal services; trade, restaurants and hotels; finance, insurance, real estate and other business services; and transportation, storage and communication. Women accounted for about 36 percent of the employment in these sectors. On the other hand, three sectors experienced employment losses during the periods covered. These were agriculture, construction and manufacturing. Women comprised only about 19 percent of employment in these sectors.³

Turning to column 2, we see that women's share of employment within sectors has also been increasing. The only exception to this has been in Haiti where, as mentioned above, women's labor force participation has been declining. The magnitude of column 2 relative to column 1 is reported in column 5 of Table 2. In seven of the ten countries, column 2 is larger (in absolute value) than column 1. This is especially true for Brazil, where women's labor force participation has been increasing extremely fast. However, with the exceptions of Brazil and the three countries where column 1 dominates (Costa Rica, Panama and Venezuela), another fairly consistent story emerges: the effects of within sector changes are about two to three times as large as the effects of changes in sectoral composition.

Summarizing what we have learned from this decomposition, women's share of total employment has grown in recent years throughout Latin America. This is in part due to increases in the importance of sectors which tend to employ relatively more women. These increases can be attributed to economic development and to trade liberalization. However, bigger gains have come from

³ The three sectors which neither grew nor contracted were utilities, mining and other. Women comprised 12 percent of employment in these sectors.

increases in the proportion of women employed within each sector. These may be attributed to increased reliance on flexible labor, to increased education levels among women, to increasing access to birth control, or to decreases in work place discrimination.

Finally, it is useful to compare women's employment gains in Latin America with similar numbers for developed countries. The bottom panel of Table 2 contains a similar decomposition for four developed countries. The last two rows in each panel report unweighted means and standard deviations for the two country groups. Although the standard deviations are large (especially for Latin America), the means are virtually identical across the two groups. Women's share of total employment (column 4) in Canada, Japan, the United Kingdom and the United States has been increasing at an average rate of .39 percent per year, which is about the same rate as in Latin America. Moreover, the effect of within sector growth in female employment is 3.5 times as large as the effect of changes in employment composition in these four developed countries, just as in Latin America.

2.2. Determinants of Women's Labor Force Participation Differences Across Countries

In this section we report women's labor force participation rates for a large fraction of the countries in the region, using the World Bank *Social Indicators of Development 1989* as a database. Using a cross-country/time-series analysis for a sample of 20 Latin American countries for the period 1965-1987, we find that there are a few variables that explain cross-country and time series variations in women's labor force participation. These are, in order of importance: fertility, women's education level, the fraction of total population living in urban areas, and the cyclical variation of economic activity.

Our database enables us to calculate ratios of female labor force to female population (FLFPR). These ratios are smaller than female labor force participation, where the denominator is female working age population. In fact, the estimated FLFPR ratios are approximately one half of the conventional labor force participation ratios as reported in Table 1. The one advantage of this data set is the length of the time series: about 22 years for each country. Table 3 shows the variable FLFPR for the first and last years in the sample (1965-1988), along with first and last year estimates for the related variables.

Total fertility rate (TFRT), is the average number of children that would be born alive to a woman during her lifetime, if she were to bear children at each age in accordance with prevailing age-specific fertility rates. Variations in female education levels across countries were captured by including female secondary education ratios; that is, the fraction of women in secondary school over the

number of women of secondary school age (FSEC). Since FSEC was not available for every year, we estimated linear time trends derived from the reported data. The reward for time spent in the labor market is a function of the educational attainment of working-age women, rather than of secondary-school-age women. The lagged value of FSEC (FSEC₋₃) corresponds to the estimated levels of FSEC for the group of women that are approximately between 18 and 23 years of age, which is a better estimate of the school attainment of working-age women. UPOPL is the ratio of urban to total population. Annual real GNP per capita (AGNP) is measured in 1985 US\$. This variable helps us place each of these countries in terms of overall economic development level. Another variable, used in our regression analysis but not shown in the table is CYCLE. CYCLE is equal to the difference (in logs) between each country's actual real GNP per capita and its trend.

TABLE 3

CHANGES IN VARIABLES BETWEEN 1965 AND 1987
1965/1987

Country	FLFPR	TFRT	FSEC ₋₃	UPOPL	AGNP
Argentina	18.1/19.5	3.07/2.96	23/68	76.1/85.4	791
Bolivia	13.9/15.5	6.59/6.06	13/31	40.0/50.0	183
Brazil	12.6/19.5	5.65/3.46	9/40	50.4/74.8	538
Chile	13.9/20.3	4.78/2.73	25/66	71.7/84.6	635
Colombia	12.1/14.3	6.34/3.19	9/51	53.5/68.9	361
Costa Rica	10.2/15.3	6.26/3.26	23/50	38.1/44.5	503
Dom.Rep.	5.9/9.0	6.93/3.75	8/53	35.1/58.1	299
Ecuador	10.4/11.8	6.78/4.33	16/53	37.2/54.6	340
El Salvador	12.2/16.7	6.71/4.86	14/24	38.9/43.6	260
Guatemala	7.9/9.1	6.70/5.77	5/17	34.3/32.7	337
Honduras	8.2/11.1	7.40/5.55	9/35	25.7/41.7	227
Jamaica	31.3/44.0	5.42/2.86	41/63	37.6/50.9	517
Mexico	9.5/18.3	6.71/3.78	12/51	54.9/71.1	667
Nicaragua	11.4/15.1	7.19/5.50	13/48	42.7/58.2	298
Panama	17.7/19.6	5.74/3.14	25/65	44.4/53.6	591
Paraguay	13.6/13.8	6.56/4.58	9/28	36.2/46.0	334
Peru	12.6/15.5	6.68/4.05	8/60	51.9/68.8	433
Trinidad	18.8/23.1	4.33/2.80	20/74	30.0/66.5	1252
Uruguay	20.1/23.6	2.84/2.61	14/69	81.1/85.1	722
Venezuela	11.8/19.0	6.12/3.77	24/48	69.8/83.0	1245

Own calculations based on World Bank (1989) data.

It can be observed in Table 3 that those countries where fertility has fallen by the largest proportions are also countries where women's labor force participation has increased most dramatically. These data also suggest that women's labor force participation is closely related to education.

The problem one encounters in trying to estimate an equation for FLFPR is that there is a significant degree of simultaneity between the variables that affect it. The observed fertility rate, for example, is determined by the desired level of fertility in combination with the degree to which natural fertility can be controlled. While the desired level of fertility depends on variables that affect the cost and benefits of raising children (labor market opportunities for women, availability of a social security system, infant mortality rate), the degree to which the desired fertility rate is achieved depends on the availability and cost of birth control methods, as well as on the levels of education of the adult population. To deal with the simultaneity problem, we used a two stage least squares procedure using the variable infant mortality (INFMORT) as an instrument for total fertility (TFRT).

The time series-cross country evidence was then summarized in an equation of the following form:

$$FLFPR_{t,j} = \alpha + \beta (UPOPL)_{t,j} + \delta (FSEC_{-2})_{t,j} + \sigma (TFRT)_{t,j} + \phi (CYCLE)_{t,j} + \mu_{t,j} \quad (4)$$

As can be observed in Table 3, Jamaica's female labor force participation rate is well above the rest of the countries'. Since the differences between Jamaica and the rest of the Latin American countries included in the sample are not well explained by equation (4), Jamaica represents a classic outlier. Therefore, we used a dummy variable for Jamaica.

The evidence summarized by the first round of estimates was the following. Women's labor force participation increases with urbanization levels, with the level of education of women in the labor force (measured by lagged values of female secondary education coverage), and with reductions in predicted fertility. From time-series analyses on a country-by-country basis we found that the cyclical effects were significant and typically negative among the lower income countries, but not clearly significant among higher income countries. Based on this evidence, we changed the specification in the pooled cross-section/time-series analysis, allowing the CYCLE coefficient to vary according to the level of income per capita. In one specification, we divided the sample into three groups of countries, letting the CYCLE coefficient take three alternative values. Obviously, the cutting points for that specification were somewhat arbitrary. Our preferred specification, reported in Table 4, includes an interaction of CYCLE and AGNP.

The results indicate that economic downturns increase female labor force participation among low income countries. The impact of economic cycles declines as income per capita increases, it becomes zero at an annual per capita income of \$ 845.6 (1985 US dollars), and changes sign for countries with annual per capita incomes above \$845.6.⁴ This is an interesting empirical finding, since there is no a priori reason to expect this relationship to be positive or negative. However, it makes considerable economic sense. Recognize that family incomes in low income countries are at or near subsistence levels. Then during periods of economic downturn, when real wages and employment levels fall, all family members will enter the labor force in order to maintain that subsistence level of income. For these families, the marginal utility of income is high relative to the value of leisure. In higher income countries, on the other hand, life is somewhat more comfortable. If employment opportunities decline, some family members will not bother looking for work, since the marginal utility of income is low relative to the value of leisure. In other words, the evidence suggests that the 'added worker effect' dominates the 'discouraged worker effect' among the low income countries, while it fails to do so among the high income countries.⁵

TABLE 4
2SLS REGRESSIVE DETERMINANING FACTORS
FROM FLFPR VARIATIONS ACROSS COUNTRIES:
LATIN AMERICA 1965-88

Variable	Coefficient	T-Statistic	Sample Mean
FLFPR			15.57
INTERCEPT	18.33	6.80	1.0
UPOPL	0.044	3.41	54.762
FSEC _s	0.044	2.15	32.504
TFRT	-1.590	-4.66	4.815
CYCLE	-3.509	-2.38	0.018
CYCLE*AGNP	0.004	1.90	9.852
JAMAICA	20.583	30.87	0.050

Adjusted R squared = 0.832

Number of observations = 439 (20 countries, about 22 observations per country from 1966 to 1987).

Dependent variable = female labor force as a percentage of total female population.

As Table 4 indicates, the variables that explain variations in female labor force participation across time and across countries are, in order of importance: total fertility, urbanization and female secondary education. Yet, a large swing in the

⁴ The turning point is found by taking the derivative with respect to CYCLE and setting it equal to zero.

⁵ This is consistent with the findings of Psacharopoulos and Tzannatos (1992) reported on page 4 of our paper.

level of economic activity, particularly if it affects a low income country, can have a significant impact on female participation in the labor force.

With the evidence collected from the cross-country/time-series analysis, we turn to the examination of the same question using micro data. The ideal context for analyzing the impacts of cyclical changes and structural adjustment is with individual survey data. In the following section, we analyze the response of female labor force participation to cyclical changes, using survey data from Santiago, Chile for the period 1974 and 1987. We are particularly interested in separating the effect of economic cycles on the opportunity cost of time into substitution and income effects. The first one is referred as the 'discouraged worker effect' in the context of economic downturns. The second is referred to as the 'added worker effect'. At the level of family decision making, these two can be separated.

2.3. Female and Male Employment Rates - The Case of Chile

In this section, we use a very rich data set from the Greater Santiago Area of Chile's labor market, to examine more directly the effects of macroeconomic variables on women. The Greater Santiago Area represents about one third of the country's labor market. It is predominantly urban, with a marked concentration of service-type activities. The information comes from the University of Chile June Surveys -which ask about wages received during the month of May and labor market participation during the week preceding the survey- for every year between 1974 and 1987. The survey collects information on individual characteristics of every member of about 2,500 households (age, education, sex, labor force participation etc.). In the analysis which follows, we look only at the responses of heads of households and spouses of heads of households. This sampling choice allows us to examine the influence of spouse employment on the individual's participation decision and separate it from the impact of aggregate unemployment. In this way, the 'added worker' and the 'discouraged worker' effects can be separated. In addition to survey data, we use published information on unemployment rates to create some of the control variables.

The results for separate employment equations for men and women are presented in table 5, and the variables are defined in table 6. These show the usual patterns. Evaluated at the means, each year of formal education increases a woman's probability of employment by 1.1 percent. The first child under age 6 decreases the probability of employment by 4 percent, additional children under age 6 decrease employment probability by an additional 3 percent, and absence of a husband increases the probability by 20 percent. If a woman's husband is present but unemployed, the probability of the woman being employed increases by 3 percent, as compared to the case where the husband is working. There is an additional time trend increase of women's employment probability of 0.14 percent per year.

TABLE 5

CHILE: DETERMINING FACTORS FOR FULL-TIME EMPLOYMENT - PROBING ESTIMATES

(Sample of Married Individuals and Single Heads of Household)

VARIABLE	Women			Men		
	MEAN	dEMP/dX	STD ERR	MEAN	dEMP/dX	STD ERR
INTERCEPT	1.000	-0.7611**		1.000	-0.0451	
YE	8.169	0.0107**	0.00268	9.007	0.0097**	0.00258
AGE	42.369	0.0267**	0.00474	43.724	0.0264**	0.00439
AGE2	2003.810	-0.0004**	0.00005	2113.330	-0.0004**	0.00004
DNOKID	0.193	0.0702**	0.02254	0.198	-0.0232**	0.02247
PCHILDL6	0.346	0.0133	0.04040	0.372	0.0122	0.00404
NCHILDL6	0.509	-0.0290**	0.02307	0.552	-0.0002	0.01999
YRSHOME	1.506	-0.0330**	0.01407	1.637	-0.0189**	0.01368
YHXYE	13.260	0.0023**	0.00092	15.521	0.0013**	0.00084
YHXEX	9.852	0.0010**	0.00063	26.819	0.0003*	0.00040
SNOTPRES	0.206	0.2031**	0.04146	0.098	-0.0194	0.03464
SLF	0.692	0.0169*	0.03366	0.225	-0.0326**	0.01961
SUNEMP	0.078	0.0312**	0.02938	0.024	-0.1468**	0.04759
SYE	7.199	0.0006	0.00264	7.502	0.0080**	0.00278
T	6.448	0.0014**	0.00206	6.400	-0.0069**	0.00197
TUNEMP	15.419	-0.0015**	0.00199	15.411	-0.0106**	0.00193
No. OBS	40222			35398		
DEP VAR MEAN	.194			.681		

**significant at the 1% level.

* significant at the 5% level.

TABLE 6

DEFINITIONS FOR VARIABLES

EMP:	Dummy	=1 if individual is employed full time =0 else
YE	years of education	
AGE	age	
AGE2	age squared	
DNOKID	Dummy	=1 if individual has no children at home =0 else
PCHILD6	Dummy	=1 if individual has a child younger than 6 =0 else
NCHILD6	Number of children younger than 6 years of age	
YRSHOME	Years until youngest child reaches school age =0 if no children younger than 6	
YHXYE	YRSHOME multiplied by YE	
YHXEX	YRSHOME multiplied by (AGE-YE-6)	
SNOTPRES	Dummy	=1 if spouse is not present =0 else
SLF	Dummy	=1 if spouse is in the labor force =0 else
SUNEMP	Dummy	=1 if spouse is unemployed =0 else
SYE	Spouse's years of education	
T	Time trend: 1974 = 1, 1975 = 2, ... 1987 = 14	
TUNEMP	Aggregate unemployment rate	

For men, additional years of education have similar effects as for women, but the presence of young children or a wife have no effect. However, if a wife is present, her work status does affect husband's participation. If she is present and working, the husband's probability of employment declines by 3.3 percent, and if she is present and unemployed, the husband's employment probability declines by 15 percent, as compared to the case of wife present and not in the labor force.

The additional time trend effect is a 0.7 percent per annum decrease in the probability of male employment.⁶

The coefficient on aggregate unemployment measures the effect of the state of the labor market in general on the probabilities of employment for men and women, as opposed to the labor market status of a spouse. The estimated coefficients imply that every 1 percent increase in the unemployment rate caused an average woman's employment probability to fall by .15 percent and an average man's employment probability to fall by 1.06 percent. However, the raw numbers do not tell exactly the right story. Rather, the relevant comparison is how changes in the unemployment rate affect the employed population. For example, if the workforce contains three times as many men as women, then we would say that increases in unemployment were 'gender neutral' if three times as many men as women lost their jobs. Algebraically, the effect is 'gender neutral' if $(.15/1.06) = (\# \text{ women employed} / \# \text{ men employed})$ or if

$$\frac{.15}{\# \text{ women employed}} = \frac{1.06}{\# \text{ men employed}}$$

Assuming there are equal numbers of women and men in the population, we can substitute the proportions of women and men employed in the denominators which, for our sample, are .194 and .681 respectively. Making these substitutions, the relative impact of changes in the unemployment rate on women is 0.77 and the relative impact on men is 1.56. Changes in unemployment had a proportionate effect on men that was twice as large as the effect on women.

In order to examine this effect further, we estimated a similar set of models, with male and female labor force participation, rather than full-time employment as the dependent variables. We found that a 1 percent increase in the

⁶ Other versions of these employment equations included own and spouse nonwage income, as well as spouse wage income. The theoretical justification for including these variables was to allow income from other sources to generate an increase in consumption of leisure (a decrease in employment).

As expected, we found that the employment probabilities of both men and women were inversely related to spouse's nonwage income. On the other hand, however, we found that employment probabilities were positively related to own nonwage income. This alerted us to a possible specification problem: if nonwage income reflects one's accumulated assets, and if accumulated assets are largely a function of wage history, then nonwage income will be correlated with experience and unobserved measures of labor force productivity. Thus, nonwage income was not the appropriate variable to control for the opportunity cost of time outside the labor market.

Spouse's wage income also had an unexpected effect on employment probabilities: spouse's wage was positively related to the probability of employment for both men and women. However, in similar models with labor force participation as the dependent variable, spouse's wage had the anticipated negative effect. Apparently, while high earnings by a spouse tend to discourage participation, another effect dominates the probability of employment: people for whom the unobserved dimensions of productivity are especially high or who are more committed to finding work tend to marry people with those same traits. Not surprisingly, spouse's education is a very good proxy for spouse's income, and it was available for a much larger number of cases, thus we used SYE in the specification presented here.

unemployment rate caused an average woman's labor force participation probability to fall by .14 percent and an average man's participation probability to fall by .08 percent. Not surprisingly, women are more likely than men to withdraw from the workforce during economic downturns. The effect is magnified if we take into account the fact that women are less likely to be in the labor force in the first place. Using a transformation similar to that employed in the previous paragraph, we find that the adjusted effect of changes in the unemployment rate on labor force participation is .48 for women and .10 for men.

The most important point, then, is that recent increases in Chilean unemployment had larger effects on male employment than on female employment (other things equal). However, women were more likely than men to be discouraged by high unemployment rates and to leave the labor force. Thus, a study which looked at unemployment rather than employment would understate the effect of cyclical swings on women. Moreover, those married women whose spouses were unemployed had a 3 percent higher probability of being employed than other women at the sample mean of the independent variables.

3. CONCLUSIONS

This paper reviews the existing literature on women's labor force participation in Latin America, paying special attention to the effects of macroeconomic conditions. It also presents three new pieces of empirical evidence.

For the most part, the previous literature concentrates on the effects of human capital and demographic variables on labor force participation. It shows that, throughout most of Latin America, women's labor force participation is increasing. This is due to increasing educational opportunities and declining fertility. Both are worldwide trends.

It has already been established that women and men differ significantly in the sectoral composition of employment. Since economic growth and economic cycles affect the composition of employment, we examined the relative impacts of these changes on men and women. Section 2.1 reports that changes in employment composition brought about by economic growth have a positive effect on women, but that the magnitude of these changes is small relative to the other factors affecting women's employment. Moreover, we find that sectoral changes in Canada, Japan, the United Kingdom and the United States (the only countries outside of Latin America which we considered) produced similar increases in women's employment during approximately the same period.

Using aggregate data for twenty countries and for the period 1965-1987, we attempted to explain variations in female labor force participation. We found

that reductions in fertility, rising education levels and rising urbanization explain much of the variation. Moreover, we examined the effect of real GNP per capita variations from trend on female labor force participation rates. Our results suggest that the magnitude of this cyclical effect depends on the level of income per capita. In particular, the coefficient turns out to be negative and significant for low income countries, and positive but non-significant among high income countries. The findings indicate that part of the rapid growth in labor supply observed in Latin America during the eighties is explained by the entry of women into the labor market. Some of the factors behind this phenomenon have been developing for some time. These include the rising urbanization, the increasing levels of education among females and the declining fertility rates. But, as economic conditions worsened in the low income countries, women joined the labor force in larger proportions than they would have under normal economic conditions.

Our access to survey data for Chile enabled us to look more directly at the employment effects of business cycles. We used a time-series/cross-section model to see how changes in the aggregate unemployment rate affected employment probabilities of men and women. We control for numerous other variables that have been shown to affect labor force participation. The effects of macroeconomic cycles, as measured by the impact of the aggregate unemployment rate on the probability of employment, are seen to be larger for men than for women. While women were more likely than men to be discouraged by high unemployment rates and to leave the labor force, those married women whose spouses were unemployed had a 3 percent higher probability of being employed than other women at the sample mean of the independent variables.

REFERENCES

- CASTAÑEDA, T. (1981): "Los Determinantes de la Participación de la Mujer Casada en el Mercado de Trabajo Urbano en Colombia", *Estudios de Economía*, Vol. 17, 111-34.
- FUNKHOUSER, E. (1990): "Mass Emigration, Remittances, and Economic Adjustment: The Case of El Salvador in the 1980s," NBER Conference on Immigration in Cancun, México.
- GARCIA, I. and E. GOMARIZ (1989): *Mujeres Centroamericanas*, Tomo I: Tendencias Estructurales. Flacso.
- GINDLING, T.H. (1990): "Women's Earnings and the Economic Crisis in Costa Rica", North-East Development Economics Conference. Economic Growth Center, Yale University.
- HORTON, S. (1990): "Labour Markets in an Era of Adjustment: Bolivia", Forthcoming in *Labor Markets in an Era of Adjustment*, edited by D. Mazumdar and S. Horton. World Bank, Economic Development Institute.
- INTERNATIONAL LABOUR ORGANIZATION: *Yearbook of Labour Statistics*, various issues.
- PSACHAROPOULOS, G. and Z. TZANNATOS (1991): "Women's Employment and Pay in Latin America". The World Bank. Latin America and the Caribbean Technical Department. Regional Studies Program Report, 10.
- _____ (1992): *Latin American Women's Earnings and Participation in the Labor Force*, The World Bank. Policy Research Working Papers Series WPS 852.
- SCHULTZ, T.P. (1990): "Women's Changing Participation in the Labor Force: A World Perspective", *Economic Development and Cultural Change*
- SEDLACEK, G. (1990): "Estrategias de Geracao de Renda das Familias Brasileiras: Um Estudo da Participacao da Mulher no Mercado de Trabalho", IPEA.
- UTHOFF A. and M. POLLACK (1985): "Análisis Macroeconómico del Ajuste del Mercado de Trabajo". Costa Rica 1979-1982. Lecciones para un Modelo Macroeconómico". *Estudios de Economía*, Vol 12, 83-111.
- WORLD BANK (1989): *Social Indicators of Development* (data on diskette), Johns Hopkins University Press, 1989.