Recent Fertility Declines
in Brazil, Colombia, and Mexico

Thomas W. Merrick

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Number 17
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Thomas W. Merrick

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FOREWORD

This paper is one in a special series of World Bank Staff Working Papers on population change and development. Prepared as background papers for the World Development Report 1984, they provide more detailed treatment and documentation of the issues dealt with in Part II of the Report. The papers cover a range of topics, including the effects of population growth and change on economic development, the determinants of fertility and mortality, the links between population growth and internal and international migration, and the management, financing, and effectiveness of family planning programs. They include several country and regional studies of fertility change and population policy.

The background papers draw on a large number of published and unpublished studies of individual researchers, on Bank policy analysis and research, and on reports of other organizations working on population and development programs and issues. The papers are the work of individuals and the views and interpretations expressed in them do not necessarily coincide with the views and interpretations of the Report itself.

I hope these detailed studies will supplement the World Development Report 1984 in furthering understanding of population and development issues among students and practitioners of development.

Nancy Birdsall
Staff Director
World Development Report 1984
Some of the Papers in the Population and Development Series


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Abstract

Because of decline in fertility, population growth has been declining in Brazil and Colombia since the mid-1960s and in Mexico since the mid-1970s. The rapidity of the declines is one of the most striking similarities among the three countries. They also had similar levels of urbanization, life expectancy, and female literacy, but they differed in the way in which their population policies evolved. Colombia, with the highest initial fertility and most rapid decline, was the earliest to organize large-scale family planning. In Mexico, the onset of rapid fertility decline coincided with a major change in national policy on public support of family planning. Brazil did not have a national population program, though the use of contraceptives spread through private commercial channels as well as through privately organized family planning programs.

The paper examines the determinants of the onset and spread of fertility decline in each country and concludes that both supply and demand factors contributed to their acceleration. Analysis of the proximate determinants of fertility indicates increased use of effective contraceptives as the main contributor on the supply side. Demand was important because the fertility decline was also related to increased economic pressures on lower income classes. Overall, the decline in fertility has accelerated because it has spread to these income groups.
La baisse de la fécondité a entraîné un ralentissement de la croissance démographique au Brésil et en Colombie dès le milieu des années 60, et au Mexique depuis le milieu des années 70. L'une des ressemblances les plus frappantes entre les trois pays, qui avaient par ailleurs des niveaux similaires d'urbanisation, d'espérance de vie et d'alphabétisation des femmes, réside dans la rapidité de ce ralentissement. Cependant, leur politique démographique a évolué de façon fort différente. La Colombie, qui avait au départ le taux de fécondité le plus élevé et a enregistré la baisse la plus rapide, a été la première à mettre en place des services de planning familial à vaste échelle. Au Mexique, la baisse rapide de la fécondité a coïncidé avec un changement majeur dans la position des pouvoirs publics touchant l'appui au planning familial. Le Brésil n'avait pas de programme national de population, mais l'emploi de contraceptifs s'est étendu par les circuits commerciaux privés et grâce à des programmes de planning familial privés.

Le document examine les facteurs qui ont déterminé le déclenchement et la généralisation de la baisse de la fécondité dans chaque pays et conclut que l'offre et la demande ont toutes deux joué un rôle dans l'accélération du processus. Du côté de l'offre, l'analyse des déterminants immédiats de la fécondité fait ressortir que le recours accru à des contraceptifs efficaces a joué un rôle clé. La demande n'est pas à négliger non plus, puisque le recul de la fécondité est lié à l'intensification des pressions économiques sur les classes à faible revenu. Dans l'ensemble, la baisse de la fécondité s'est accélérée parce qu'elle s'est étendue à ces groupes de revenu.
Extracto

En razón de los más bajos niveles de fecundidad, el crecimiento de la población ha disminuido en el Brasil y Colombia desde mediados del decenio de 1960, y en México desde mediados del de 1970. Una de las similitudes más notables entre dichos países es la rapidez de la disminución registrada en cada uno de ellos. Los tres tenían además niveles similares de urbanización, esperanza de vida y alfabetización femenina, pero diferían en la manera en que evolucionaron sus respectivas políticas de población. Colombia, donde había el más alto nivel inicial de fecundidad y se registró la disminución más rápida, fue el primero en organizar la planificación familiar en gran escala. En México, el comienzo de la rápida disminución de la fecundidad coincidió con un importante cambio de la política nacional en cuanto al apoyo del sector público a la planificación familiar. El Brasil no tenía un programa nacional de población, pero el uso de anticonceptivos se difundió a través de conductos comerciales privados, así como de programas de planificación familiar organizados privadamente.

En el documento se examinan los elementos determinantes del comienzo y difusión del descenso de la fecundidad en cada país y se llega a la conclusión de que los factores de la oferta y la demanda contribuyeron a su aceleración. El análisis de las causas inmediatas de la fecundidad revela un uso acrecentado de anticonceptivos eficaces como el factor principal desde el punto de vista de la oferta. La demanda revistió importancia puesto que la disminución de la fecundidad estuvo relacionada también con las mayores presiones económicas sobre los grupos de ingresos más bajos. En conjunto, la disminución de la fecundidad se ha acelerado porque ha llegado a estos grupos.
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</table>
Brazil, Mexico, and Colombia account for 60 percent of Latin America's total population of 390 million people, and 63 percent of its 12 million annual births. All three have experienced very rapid rates of population growth during the last three decades. Average annual rates accelerated to levels of 3 percent or more during the 1950s and 1960s, when death rates had declined but birth rates remained high. Since the mid-1960s growth rates have been falling in Brazil and Colombia as a result of declines in fertility, with Mexico following in the mid-1970s. One of the most striking similarities among the three countries is the rapidity of these fertility declines (see Table 1 for comparative demographic and socio-economic measures). By the early 1980s, Colombia's birth rate was 29 per thousand, compared to 46 in early 1960s. Brazil's was 30, as against 43 per thousand, while the corresponding figures for Mexico were 32 and 45 per thousand.

All three countries have official population policies, but differ as to when the policy was adopted and in the nature of the policy. According to Nortman (1982), Colombia and Mexico have official policies to reduce their population growth rates and to support family planning for that purpose, while Brazil is listed as supporting family planning for other purposes. Colombia adopted its official policy in 1970, but had been very permissive toward private sector and international agency support of family planning in the years prior to establishing a national policy. Mexico adopted its policy at the end of 1973. This was an abrupt shift from its earlier pronatalist position, which had been quite restrictive about outside support of family
<table>
<thead>
<tr>
<th></th>
<th>Brazil</th>
<th>Colombia</th>
<th>Mexico</th>
</tr>
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<tbody>
<tr>
<td>Per capita income</td>
<td>2050</td>
<td>1180</td>
<td>2090</td>
</tr>
<tr>
<td>(1980 $U.S.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average annual growth</td>
<td>5.1</td>
<td>3.0</td>
<td>2.6</td>
</tr>
<tr>
<td>in GNP per capita</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1960-80)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population, mid-1980</td>
<td>118.8</td>
<td>26.7</td>
<td>69.8</td>
</tr>
<tr>
<td>(millions)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban population,</td>
<td>46</td>
<td>48</td>
<td>51</td>
</tr>
<tr>
<td>percent of total</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1960)</td>
<td>68</td>
<td>64</td>
<td>67</td>
</tr>
<tr>
<td>(1981)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adult literacy, percent</td>
<td>61</td>
<td>63</td>
<td>65</td>
</tr>
<tr>
<td>(1960)</td>
<td>76</td>
<td>81</td>
<td>83</td>
</tr>
<tr>
<td>(1980)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Life expectancy</td>
<td>57</td>
<td>53</td>
<td>57</td>
</tr>
<tr>
<td>(1960)</td>
<td>66</td>
<td>63</td>
<td>66</td>
</tr>
<tr>
<td>(1981)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Infant mortality</td>
<td>118</td>
<td>103</td>
<td>91</td>
</tr>
<tr>
<td>(1960)</td>
<td>75</td>
<td>55</td>
<td>54</td>
</tr>
<tr>
<td>(1981)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income distribution:</td>
<td>10.0</td>
<td>9.0</td>
<td>9.5</td>
</tr>
<tr>
<td>Share of lowest 40% in</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>total household income</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(around 1970)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent decline in crude</td>
<td>30.2</td>
<td>34.8</td>
<td>28.9</td>
</tr>
<tr>
<td>birth rate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1960-1980)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: World Development Indicators section of World Bank, World Development Report, 1983 except income distribution data, which are taken from Chenery et al. (1974).
planning. Since then it has established a National Population Council charged with stabilizing population growth, set specific growth targets, and moved vigorously to build a network of family planning clinics.

Brazil incorporated a population policy statement in a 1974 National Development Plan. It called for an assessment of the social and economic impact of demographic factors, but stopped short of admitting to the need for control of population growth or providing federal government support for family planning programs. Brazil has been permissive about private and international agency support for family planning. Several state governments have established programs in cooperation with those agencies. In Brazil, as well as Mexico and Colombia, private commercial sales of contraceptives and private sector physicians have played an important role in making family planning available to middle and upper income class urban couples.

Explaining Recent Fertility Declines.

The recent rapid declines of fertility in these three countries raise two basic questions. First, why did birth rates remain so high until the middle 1960s (for Mexico, the middle 1970s), even though all three by then had achieved significant levels of urbanization and advancement on other scales of modernization such as per capita income, education, and life expectancy? Second, what social and economic changes, combined with changes in reproductive attitudes and practices, led to declines in fertility that appear to be as rapid, or even more so, than the declines in mortality that occurred a few decades earlier? Are we witnessing a Latin American variant of the European demographic transition? Or does this experience represent something new in terms of the relation between demographic and socio-economic variables?
There has been considerable skepticism about the applicability of the European transition model to Latin American experience. Arriaga (1970) wrote:

The European fertility-mortality pattern could not have been repeated in Latin America between 1930 and 1960 principally because of the shorter period of time allowed for change in the latter. In addition, a decline in fertility in response to falling mortality was hampered by the particular social, cultural, educational, and economic characteristics of Latin American countries.

Coale (1978), writing on the relation between population and development in Mexico, added:

The Mexican experience must also be viewed as paradoxical for those who hold the optimistic position that countries with rapid population growth need have no concern about it, because social and economic progress automatically bring down birth rates... The Mexican population in 1975 was more than 72 percent literate and more than 60 percent urban, the per capita income had nearly doubled in 20 years, the expectation of life had risen to about 65 years and was still increasing; nevertheless, fertility until 1975 was, if anything, higher than it was 20 years before.

While most commentators agreed that the Latin American context between 1940 and 1970 was too complex to allow a straight-forward application of demographic transition theory to the question of when and how fertility would decline, not all were as skeptical of its validity as Arriaga and Coale. Beaver (1975) and Oeschsli and Kirk (1975) argued that the theory did yield generalizations that were applicable to Latin America. Each examined a wide range of social and economic indicators associated with modernization. Oechsli and Kirk predicted that a number of countries in the region were on the threshold of very rapid fertility decline by 1960. Beaver postulated that once fertility decline was underway, it would be at least as rapid as the decline in mortality.

Coale himself argued that a broader view of transition theory was needed. In a review of the theory (1975), he concluded that three broad generalizations relevant to developing countries could be derived from the theory. They are the conditions required for onset of a fertility decline:
That fertility must be within the calculus of conscious individual choice (as opposed to biological limitations or social mechanisms that affect fertility); (2) That fertility reduction must be perceived as advantageous by individuals making reproductive choices; and (3) That effective means of fertility control must be available. If recent fertility declines in Brazil, Colombia, and Mexico represent a demographic transition defined in Coale's terms, then one should be able to explain the persistence of high fertility until the mid-1960s as well as the shift to rapid fertility decline after that in terms (1) of the absence of one or more of the conditions with respect to broad segments of their populations until about 1965, and (2) of changes in one or more of the conditions since then. Stating these questions in terms of Coale's conditions raises further questions about how they relate to each other: i.e., is any one of the conditions both a necessary and a sufficient condition for fertility decline? For example, motivation would appear to be a necessary condition, but not sufficient without access to the means to control. Access could also be a necessary condition, but not sufficient without motivation.

At least two scenarios suggest themselves. One is that there was pent-up demand in these societies for smaller families, but it was not realized because access to the means of fertility control was limited. It was realized when the means finally did become more widely available. For purposes of discussion, label the supply access condition as hypothesis A. Another possibility is that one or both of the other two conditions changed. That is, in addition to changes in supply (necessary condition), there were also changes either in the degree to which couples were thinking about smaller families and what they could do to achieve them (Coale's calculus of conscious choice) or in the relative advantages and disadvantages of smaller versus
larger families, or both. Label the motivation condition as hypothesis B. While birth control consciousness can be conceptualized as a separate hypothesis, it is more likely that changes in this condition would accompany increased access to family planning or increased motivation, or a combination of both. For this reason, we do not consider it as a separate hypothesis.

When one examines conditions during the 1960s and changes that have occurred since at the national level, there is a strong prima facie case for hypothesis A. By 1960, these countries had achieved comparatively high levels on modernization scales that social scientists had been using to measure the "demand" side of fertility: urbanization, life expectancy, literacy and educational attainment. What was perplexing to so many observers was the persistence of high fertility rates in the face of such high levels of apparent modernization.

The paper will suggest that the persistence of high fertility is much less difficult to understand if one pays attention (1) to distribution as well as the level of achievement of modernization variables and (2) to differences in the impact of macro-level socioeconomic changes on different groups which had high fertility prior to 1965 but experienced decline after. In 1960, as well as 1980, national averages masked significant rural-urban, regional and socio-economic class differentials in fertility and other demographic models in all three countries. Fertility had begun to decline in the "modern" groups and regions, but remained high for those who had not participated as much in the modernization process. National level fertility declines occurred because lower fertility spread to lower income classes.

The distribution issue requires us to refine hypotheses A and B. In hypothesis A, the question is whether there was pent-up demand for smaller families among lower socio-economic classes which limited access to family
planning prevented them from realizing. In hypothesis B, two variants are possible: (B1) Was it that in addition to increased access, there was also mobility from lower to higher status groups, so while class differences remained, the weight of lower class groups in the total diminished? and/or (B2) Did economic conditions affecting the reproductive motivation of lower class groups change, so that there was more to be gained (and possibly greater awareness of that gain) by controlling fertility during the 1970s than in the 1960s?

**Fertility Trends Since 1965.**

Neither Brazil, Colombia, nor Mexico have vital statistics systems that are reliable enough to provide accurate measurement of the timing and magnitude of recent fertility declines. The National Academy of Sciences' Committee on Population and Demography has published indirect fertility estimates covering the period from the mid-1960s to late-1970s for Brazil and Colombia, and similar information is available for Mexico. Table 2 presents estimates of the total fertility rate (TFR) derived from information in the 1960 censuses, summary estimates from the National Academy for the mid-1960s to late 1970s, as well as estimates for around 1980 that have recently become available.²

All three countries had TFRs that were 6 or more in the early 1960s. Brazil appears to have been the first to start a decline: its TFR was already lower than 6 in 1965, though the exact date of the onset of the decline is difficult to establish because estimates for the 1960s are based on retrospective reports in census and survey data from the 1970's. These are
Table 2. Trends in the Total Fertility Rate.

<table>
<thead>
<tr>
<th>DATE</th>
<th>BRAZIL</th>
<th>COLOMBIA</th>
<th>MEXICO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Around 1960</td>
<td>6.2</td>
<td>6.8</td>
<td>6.5</td>
</tr>
<tr>
<td>1965</td>
<td>5.8</td>
<td>6.6</td>
<td>6.6</td>
</tr>
<tr>
<td>1970</td>
<td>5.3</td>
<td>5.7</td>
<td>6.7</td>
</tr>
<tr>
<td>1975</td>
<td>4.7</td>
<td>4.8</td>
<td>5.7</td>
</tr>
<tr>
<td>Around 1980</td>
<td>4.3</td>
<td>3.8</td>
<td>4.1</td>
</tr>
<tr>
<td>Percent decline*</td>
<td>31.0</td>
<td>44.0</td>
<td>37.0</td>
</tr>
</tbody>
</table>

Sources: Brazil and Colombia, National Academy of Sciences, Committee on Population and Demography, Reports 12 (1982) and 21 (1983); Mexico, Potter and Alba (1983), Table 3. Mexico's 1980 figure is taken from preliminary reports of its 1982 national demographic survey.

* Around 1960 to around 1980.

subject to a variety of errors that affect timing. By 1980, Brazil's TFR had fallen 31 percent, and there were nearly 2 fewer births per woman than in 1960.

Colombia had the highest TFR among the three countries in the early 1960s. According to the National Academy of Sciences, its decline did not start until the middle of the 1960s; once underway, the decrease was even greater than in Brazil. By 1980, Colombia's TFR was 3.8, which represented 3 fewer births per woman than in 1960. The onset of fertility decline in Mexico came still later, some time during the early 1970s, since total fertility was still well over 6 in 1970. A decline of nearly 40 percent occurred between 1970 and 1980 (total fertility increased during the 1960s), indicating that the pace of decline is even more rapid than in Colombia and Brazil. In both
Colombia and Mexico, the onset of fertility decline appears to have anticipated by a short time the establishment of large scale organized family planning efforts, both private and government sponsored, but accelerated as those programs gained momentum. In Brazil, neither the onset of fertility decline nor its acceleration during the 1970s was associated with large scale organized efforts to provide family planning.

Regional and rural-urban fertility differentials characterized all three countries prior to the onset of recent declines. In Brazil, total fertility rates in Rio and Sao Paulo were three births per woman lower than in the Northeast as early as 1950, indicating that the transition to lower fertility was already underway in the Southeast by that time (Table 3). Between 1950 and 1970, total fertility actually increased in the Northeast and Frontier regions. Declines of about 0.5 births per woman occurred in Minas Gerais/Espirito Santo and the Southern region, whose 1950 fertility rates were intermediate between Rio and Sao Paulo, and in Sao Paulo. After 1970, declining fertility spread to the Northeast and Frontier, with each experiencing declines of about 1.5 births per woman during the decades. In Minas Gerais/Espirito Santo and the South, there were declines of about two births per woman. In terms of the number of births, the declines in Rio and Sao Paulo were less, since rates had been lower to begin with, though the percentage decline was substantially greater in Rio than in Sao Paulo. Thus regional differentials have narrowed during the 1970s.

Earlier declines in urban total fertility rates reflect the experiences of Rio and Sao Paulo, where much of Brazil's urban population was concentrated. By 1980, 68 percent of Brazil's population counted as urban. Urban total fertility was 4.7 births per woman in 1950, and declined only slightly between 1950 and 1970. Between 1950 and 1970 rural rates remained
steady at 7.7 births per woman and then dropped by about 1.3 births during the last decade. Aggregate fertility levels actually declined more than either the urban or rural average because of the redistribution of population from rural to urban areas. During the 1970s, rural population in Brazil declined in both percentage and absolute terms.

Table 3. Total Fertility Rates, Regional and Rural-Urban Differentials in Brazil, 1950-80.

<table>
<thead>
<tr>
<th>Region</th>
<th>1950</th>
<th>1970</th>
<th>1976</th>
<th>1980</th>
<th>80/70</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rio de Janeiro</td>
<td>4.4</td>
<td>4.3</td>
<td>3.9</td>
<td>2.9</td>
<td>.67</td>
</tr>
<tr>
<td>Sao Paulo</td>
<td>4.5</td>
<td>4.0</td>
<td>3.2</td>
<td>3.2</td>
<td>.80</td>
</tr>
<tr>
<td>Southern States</td>
<td>6.0</td>
<td>5.5</td>
<td>4.2</td>
<td>3.6</td>
<td>.55</td>
</tr>
<tr>
<td>Minas/Esp. Santo</td>
<td>6.9</td>
<td>6.3</td>
<td>4.5</td>
<td>4.3</td>
<td>.68</td>
</tr>
<tr>
<td>Northeast</td>
<td>7.5</td>
<td>7.6</td>
<td>6.3</td>
<td>6.1</td>
<td>.80</td>
</tr>
<tr>
<td>Frontier States</td>
<td>7.1</td>
<td>7.1</td>
<td>n.a.</td>
<td>5.8</td>
<td>.82</td>
</tr>
<tr>
<td>Brasil - Total</td>
<td>6.3</td>
<td>5.8</td>
<td>4.4</td>
<td>4.3</td>
<td>.74</td>
</tr>
<tr>
<td>Urban</td>
<td>4.7</td>
<td>4.6</td>
<td>3.6</td>
<td>3.6</td>
<td>.77</td>
</tr>
<tr>
<td>Rural</td>
<td>7.7</td>
<td>7.7</td>
<td>6.4</td>
<td>6.4</td>
<td>.83</td>
</tr>
</tbody>
</table>

Source: National Academy of Sciences, 1982, from census and PNAD data. 1980 estimates from Fundacap IBGE, not yet published. Note that years refer to date of census or PNAD. When fertility rates are declining, rates that are estimated by indirect methods reflect the experience of 2-3 years prior to interviews.

Neither Colombia nor Mexico is characterized by as great a degree of regional variability in fertility trends as Brazil, though both experienced
lower rates in the regions in which their capitals are located and in larger urban centers before the onset of rapid fertility decline at the national level. In Colombia (Table 4), total fertility rates were six to eight births per woman in all four of the country's main regions in 1968-69, compared to 4.5 in Bogota (which accounted for about 13 percent of total population). There was also a differential of four births per woman between total fertility in urban areas (59 percent of the 1973 population) and rural areas. Between 1968 and 1980 total fertility declined by nearly half in all four of Colombia's main regions, and by just under 40 percent in Bogota. Reductions

Table 4. Total Fertility Rates, Regional Differentials in Colombia, 1968-80.

<table>
<thead>
<tr>
<th>Region</th>
<th>1968-69</th>
<th>1975-76</th>
<th>1980</th>
<th>80/68</th>
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<tbody>
<tr>
<td>Atlantica</td>
<td>7.8</td>
<td>5.1</td>
<td>4.1</td>
<td>.53</td>
</tr>
<tr>
<td>Oriental</td>
<td>7.9</td>
<td>5.1</td>
<td>4.0</td>
<td>.51</td>
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<tr>
<td>Central</td>
<td>6.8</td>
<td>4.1</td>
<td>3.5</td>
<td>.51</td>
</tr>
<tr>
<td>Pacifica</td>
<td>5.9</td>
<td>4.6</td>
<td>3.3</td>
<td>.56</td>
</tr>
<tr>
<td>Bogota</td>
<td>4.5</td>
<td>2.8</td>
<td>2.8</td>
<td>.62</td>
</tr>
<tr>
<td>Colombia-Total</td>
<td>6.7</td>
<td>4.4</td>
<td>3.6</td>
<td>.54</td>
</tr>
<tr>
<td>Urban</td>
<td>5.2</td>
<td>3.5</td>
<td>3.0</td>
<td>.58</td>
</tr>
<tr>
<td>Rural</td>
<td>9.2</td>
<td>6.3</td>
<td>5.1</td>
<td>.55</td>
</tr>
</tbody>
</table>

Source: Ochoa, Ordonez, and Bayona, 1983.
ranged from three to four births per woman, except in Bogota. Urban fertility dropped by 2.2 births, while the rural rate fell by 4.1 births. As in Brazil, the aggregate rate fell by more than either the rural or urban rate, indicating that population redistribution contributed to the decline. In Colombia, both rural and urban total fertility started the decade at higher levels and ended it at lower levels than in Brazil, with Colombia's rural fertility decline being more than double that of Brazil in terms of the decline in number of births.

Mexico is also more homogeneous than Brazil in terms of regional differentials in total fertility before the onset of rapid declines. There is little evidence of decline in any region until the mid-1970s (Table 5). Comparison of total fertility rates derived from 1960 census data (based on reported children ever born by women in their 40s) with rates from mid-1970 survey data suggest that rates may actually have risen during the 1960s, though caution is required since there was underreporting in the 1960 census, and probably higher underreporting in regions (Golfo, Sureste, Pacifico Sur) with large Indian populations. The survey data also show a rural-urban differential of 1.6 births per woman in the early 1970s, with the rate for the metropolitan area of Mexico City being quite close to that of the urban population in general. During the 1970s, total fertility declined by 30 percent in urban areas and 26 percent in rural areas. In this, Mexico contrasts with Colombia, where rural declines were greater in absolute and relative terms. On the other hand, the onset of fertility decline was later in Mexico, and urban areas appear to have led during the earlier phases of fertility declines in Colombia and Brazil. Also in contrast to Colombia and Brazil, Mexico's decline was concentrated in the last part of the 1970s, and does not appear to have slowed down recently.
Table 5. Total Fertility Rates, Regional Differentials in Mexico, 1960-79.

<table>
<thead>
<tr>
<th>Region</th>
<th>1960</th>
<th>1971-73</th>
<th>1977-79</th>
<th>78/72</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noroeste</td>
<td>6.8</td>
<td>6.3</td>
<td>4.5</td>
<td>.71</td>
</tr>
<tr>
<td>Noreste</td>
<td>6.0</td>
<td>5.6</td>
<td>4.1</td>
<td>.73</td>
</tr>
<tr>
<td>Norte</td>
<td>6.9</td>
<td>7.3</td>
<td>5.6</td>
<td>.77</td>
</tr>
<tr>
<td>Occidental</td>
<td>6.6</td>
<td>7.5</td>
<td>5.5</td>
<td>.73</td>
</tr>
<tr>
<td>Centro</td>
<td>6.1</td>
<td>6.0</td>
<td>4.3</td>
<td>.72</td>
</tr>
<tr>
<td>Golfo</td>
<td>5.2</td>
<td>6.6</td>
<td>5.7</td>
<td>.86</td>
</tr>
<tr>
<td>Sureste</td>
<td>6.2</td>
<td>6.0</td>
<td>4.4</td>
<td>.73</td>
</tr>
<tr>
<td>Pacifico Sur</td>
<td>5.8</td>
<td>6.8</td>
<td>5.7</td>
<td>.84</td>
</tr>
<tr>
<td>Mexico--Total</td>
<td>6.6</td>
<td>6.6</td>
<td>4.5</td>
<td>.68</td>
</tr>
<tr>
<td>Urban</td>
<td>n.a.</td>
<td>5.8</td>
<td>3.8</td>
<td>.70</td>
</tr>
<tr>
<td>Rural</td>
<td>n.a.</td>
<td>7.4</td>
<td>5.5</td>
<td>.74</td>
</tr>
</tbody>
</table>

Source: 1960, Mexico, CONAPO, 1983; 1970s, Mexico, Jefatura, 1981.

The Proximate Determinants of Total Fertility.

While social and economic changes as well as population programs have played major roles in these fertility declines, in analyzing their effect it is important to recognize that the reproductive behavior of individual couples lies beneath aggregate rates. Biological and demographic factors as well as socio-economic forces influence this behavior, in particular the four proximate determinants identified by Bongaarts (1982): marriage patterns,
contraception, lactational infecundability, and abortion. Few Latin American countries have detailed enough statistical information on reproductive behavior to provide a complete account of the declines that have occurred since 1965. Colombia and Mexico participated in the World Fertility Survey during the mid-1970s, and both conducted contraceptive prevalence surveys later in the decade, but Brazil has yet to conduct a national fertility survey. Despite data limitations particularly information for establishing benchmark estimates to measure the components of declines, it is possible to piece together a fragmentary account of the proximate determinants of recent fertility declines.

Assessment of the effects of age at entry into unions and the percent of women in unions on fertility is complicated in Latin America by the influence of consensual unions on reporting practices. All three countries include consensual unions among their marital status categories. Brazil's 1960 census reported 5 percent of unions as consensual among married women between the ages of 15 and 49; the corresponding figures for Colombia (1964) and Mexico (1960) were 9 and 10 percent. The problem is not that consensual unions exist but in the likelihood that they are underreported.\(^3\)

The data (Table 6) suggest that marriage patterns have changed little since 1960; however, the strength of this conclusion depends on whether the reporting of marital status improved over the last two decades, particularly with respect to underreporting of consensual unions. If reporting did not change, then one can argue that while consensual unions were underreported, the bias is the same at both dates and age at marriage and the proportion of women in unions has not changed. This leads to the important conclusion that fertility declines that have occurred since the mid-1960s have been declines
Table 6. Trends in Marital Status and Marital Fertility.

<table>
<thead>
<tr>
<th>MEASURE</th>
<th>BRAZIL</th>
<th>COLOMBIA</th>
<th>MEXICO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent Single, Ages 20-4:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early 1960s</td>
<td>43.7</td>
<td>45.6</td>
<td>35.8</td>
</tr>
<tr>
<td>Late 1970s</td>
<td>51.6</td>
<td>48.3</td>
<td>37.8</td>
</tr>
<tr>
<td>Percent Single, Ages 50-4:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early 1960s</td>
<td>9.0</td>
<td>19.8</td>
<td>8.9</td>
</tr>
<tr>
<td>Late 1970s</td>
<td>7.8</td>
<td>12.9</td>
<td>5.1</td>
</tr>
<tr>
<td>Singulate Mean Age at Marriage:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early 1960s</td>
<td>22.1</td>
<td>21.2</td>
<td>21.3</td>
</tr>
<tr>
<td>Late 1970s</td>
<td>23.3</td>
<td>22.1</td>
<td>21.7</td>
</tr>
<tr>
<td>Consensual Unions/Percent of Total Unions for Women 15-49:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early 1960s</td>
<td>5</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>Late 1970s</td>
<td>5</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>Total Marital Fertility Rate:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early 1960s</td>
<td>9.3</td>
<td>11.4</td>
<td>9.7</td>
</tr>
<tr>
<td>Late 1970s</td>
<td>7.1</td>
<td>7.4</td>
<td>7.6</td>
</tr>
<tr>
<td>Bongaarts' Index (Cm):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early 1960s</td>
<td>.67</td>
<td>.58</td>
<td>.67</td>
</tr>
<tr>
<td>Late 1970s</td>
<td>.63</td>
<td>.57</td>
<td>.64</td>
</tr>
</tbody>
</table>

Sources: 1960s, national population censuses; 1970s, WFS and PNAD survey data.

in marital fertility, or more accurately, declines in the fertility of women in unions. This is admittedly a less clear-cut delineation of entry into unions than demographers have in mind when assessing the effect of age at marriage on the time during which women are "at risk," assuming that most births occur in unions. In fact, the majority of births do occur in unions. The three remaining Bongaarts' indices measure the fertility reducing
effects of the proximate determinants of fertility of women in unions. The first relates to postpartum amenorrhea, whose duration is linked to the prolongation of breast-feeding after childbirth. In most Latin American countries, including Brazil, Colombia, and Mexico, the average duration of breast-feeding is short (less than 10 months), particularly among urban women, and the fertility inhibiting effect of postpartum amenorrhea very limited. Colombia's 1976 WFS reported that 91.5 percent of urban women and 95 percent of rural women breast-fed their penultimate child. But the median duration of breast-feeding was 7.5 months, with shorter durations being reported for lower order births. In Mexico's 1978 WFS, the corresponding figures were 83.3 percent for urban women and 91.9 percent for rural women, with a longer average duration of breast-feeding, 9.8 months. National level data are not available for Brazil, but CPS data for a number of states indicate that the practice is very limited. Median duration of breast-feeding ranged from less than one month in the urban Southeast to around 9 months in the rural Northeast, with low durations (4-5 months) reported in all of the urban areas for which data were available.

In the absence of baseline data, most of what can be said about trends is speculative. Differences in the prevalence and duration of breast-feeding by birth order and education suggest that practice is more limited among younger, more educated women, at least until the recent revival of interest stimulated by evidence of its health benefits. Urbanization and increases in female labor force participation may also have had a dampening effect on duration, to the extent that work outside the home requires long periods of physical separation of mothers and infants, and as a consequence of inhibitions imposed by working conditions and employer attitudes. It is possible, though difficult to document, that declines in breast-feeding contributed to the
persistence of high fertility (or even increases in rate) up to the mid-1960s. Potter and Alba (1983) have suggested that increases in total fertility in Mexico during the 1960s were related to decreased breast-feeding, with rapid rural-urban migration contributing by shifting women from an environment in which it was practiced to one in which it wasn't.

The third, and statistically most elusive proximate determinant of fertility is induced abortion. Despite legal strictures, the practice is believed to be widespread in Latin America. A high proportion of abortions are clandestine, known only in terms of the large number of women seeking medical assistance for complications arising from aseptic procedures. Annual hospitalization rates on the order of 40 per 1000 women of reproductive age have been reported for Mexico City (Ordonez 1975, Tietze 1981). In 1974, the International Planned Parenthood Federation estimated that there were about 5 million illegal abortions per year in Latin America (Tietze), which corresponds to an abortion ratio of 300 per 1000 known pregnancies, and a reduction in fertility ranging from 0.8 to 0.9 according to the Bongaarts index (the reason for a range rather than a point estimate is that the index depends on the level of fertility and the proportion of women using contraception). One rationale for government support of family planning programs in the region has been to reduce illegal abortion, and it is possible that recent increases in contraception have partly substituted for abortion as a means of controlling fertility.

Most of the statistical evidence about proximate determinants of fertility points to increased and more effective use of contraception as the main reason for the acceleration of fertility declines. In evaluating this evidence, account needs to be taken of the point made in the previous section about abortion. If abortion rates have increased, or even if they have
remained constant instead of being reduced by the substitution of contraception, then abortion could be playing a more important role vis-à-vis contraception than the statistical evidence suggests.

Data from WFS and CPS surveys taken in the late 1970s and early 1980s suggest that very substantial increases in the use of effective means of preventing conception have occurred during the last decade. A summary of recent data on contraceptive use is shown in the Table 7.

Table 7. Contraceptive Prevalence by Method for Currently Married Women of Reproductive Age.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL METHODS</td>
<td>63.9</td>
<td>65.6</td>
<td>37.3</td>
<td>46.1</td>
<td>37.8</td>
</tr>
<tr>
<td>IUD</td>
<td>1.2</td>
<td>1.2</td>
<td>0.4</td>
<td>7.6</td>
<td>8.5</td>
</tr>
<tr>
<td>ORALS</td>
<td>27.8</td>
<td>33.5</td>
<td>12.9</td>
<td>17.2</td>
<td>12.5</td>
</tr>
<tr>
<td>SURG-STER*</td>
<td>16.1</td>
<td>14.1</td>
<td>14.0</td>
<td>8.0</td>
<td>8.9</td>
</tr>
<tr>
<td>OTHER</td>
<td>20.0</td>
<td>16.8</td>
<td>10.0</td>
<td>13.3</td>
<td>7.8</td>
</tr>
<tr>
<td>BONGAARTS' INDEX (Cm)</td>
<td>.37</td>
<td>.37</td>
<td>.64</td>
<td>.58</td>
<td>.63</td>
</tr>
</tbody>
</table>

SOURCE: Brazil, Thome et al. 1982; Colombia, Ochoa et al. 1983; Mexico, Ilfatina 1981.

*Note: SURG-STER=surgical sterilization; IUD included in “other” for Sao Paulo and injections included with IUD in Mexico.

As indicated above, comprehensive national level data on contraceptive use are not available for Brazil. However, a sampling of state level data from CPS surveys gives a sense of the range of regional variation. The first Brazilian CPS survey conducted in Sao Paulo showed that 54 percent of married women of reproductive age in the state were current users of contraception.
Total fertility in Sao Paulo at the time was about 3. While oral contraceptives accounted for the highest percentage of current users, 16 percent of women were surgically sterilized, suggesting that preferences for sterilization in the United States and other industrialized countries has spread to Brazil. Sterilization also plays a major role in other regions of Brazil accounting for 14 percent of women in the South (Parana, Santa Catarina, and Rio Grande do Sul) and Northeast (represented by data from Bahia, Pernambuco, Rio Grande do Norte, Paraiba, and Piaui). In some Northeastern cities, as many as 25 percent of women reported sterilization.

Recent CPS surveys for Colombia and Mexico show national averages of 46.1 and 37.8 percent of married women of reproductive age using any method; total fertility rates at the time were 4.2 and 4.7, respectively. Oral contraceptives accounted for the largest share of women using any method, followed by "other." In both, surgical sterilization accounted for a lower share than in Brazil.

These data suggest that increased contraception played a significant role in declines in total fertility rates. Assessment of the extent of their contribution requires benchmark estimates of contraceptive prevalence, preferably in the mid- to late 1960s. Unfortunately, evidence for that period is much more fragmentary. Rio de Janeiro, Bogota, and Mexico City were included in a series of surveys conducted in 1964 by CELADE and the University of Chicago, which indicate that contraception was limited both in its extent and its effectiveness (CELADE-CFSC 1972). Current use in the main metropolitan areas was 20-30 percent, and consisted mainly of traditional methods (1972). More recent Colombian surveys show: (1) increases in overall contraceptive use between the late 1960s and middle 1970s, but a slowing of those increases after 1976; (2) narrowing of rural-urban differences, with
rural areas apparently accounting for all of the increase in contraceptive use after 1976; and (3) a shift toward more effective methods, particularly in urban areas. That shift helped to offset some of the effect of the slowing of contraceptive use on fertility decline (Colombia, CCRP 1982).

For Mexico, Gallegos et al. (1977) estimated that in 1973 11-12 percent of women of reproductive age and in unions were using modern methods (pills, IUDs, injectables, sterilization, condoms and spermicides). Data from Mexico's 1976 National Fertility Survey showed more than a doubling in the proportion of women using a method between 1973 and 1976. Increased use of methods other than the pill accounted for the change: the share of the pill declined from 64 to 37 percent. From 1976 to 1979, sterilizations accounted for the largest proportional share of the 11 percentage point rise in total use and continued to increase in importance between 1979 and 1982.

Despite the lack of comprehensive benchmark data on which to base analysis of trends in contraceptive use, a fairly strong case can be made for drawing two conclusions from the data that are available: (1) that contraceptive prevalence rates observed at the end of the 1970s represent substantial increases over rates in the mid-1960s, with Mexico lagging behind Brazil and Colombia in the spread of contraceptive use; and (2) that increased use of more effective methods accounted for most of the gain, leading to an increase in the weight of those methods in the overall mix of methods.

Thus most of the reduction in fertility that has occurred can be attributed to increased use of effective contraceptive methods rather than other proximate determinants. The importance of this proximate determinant can be illustrated by calculating levels of total fertility corresponding to different levels of contraceptive use and other proximate determinants using Bongaarts' framework and values of the four indices (marriage, postpartum
amenorrhea, abortion, and contraception) that roughly approximate the experiences of Brazil, Colombia, and Mexico.

Table 8. Illustration of Effects of Changes in the Proximate Fertility Determinants on the Total Fertility Rate.

<table>
<thead>
<tr>
<th>Total Marital Fertility Rate (TMFR)</th>
<th>9.18</th>
<th>9.18</th>
<th>9.18</th>
<th>9.18</th>
<th>9.18</th>
<th>9.18</th>
<th>9.18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index of Amenorrhea ($C_a$)</td>
<td>.85</td>
<td>.87</td>
<td>.88</td>
<td>.90</td>
<td>.92</td>
<td>.93</td>
<td>.95</td>
</tr>
<tr>
<td>$TMFR \times C_a$</td>
<td>7.80</td>
<td>7.99</td>
<td>8.08</td>
<td>8.26</td>
<td>8.45</td>
<td>8.54</td>
<td>8.72</td>
</tr>
<tr>
<td>Contraceptive Use (percent)</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>50</td>
<td>60</td>
<td>70</td>
</tr>
<tr>
<td>Contraceptive Effectiveness (percent)</td>
<td>50</td>
<td>57</td>
<td>63</td>
<td>70</td>
<td>77</td>
<td>83</td>
<td>90</td>
</tr>
<tr>
<td>Index of Contraception ($C_c$)</td>
<td>.95</td>
<td>.87</td>
<td>.79</td>
<td>.69</td>
<td>.58</td>
<td>.45</td>
<td>.31</td>
</tr>
<tr>
<td>$TMFR \times C_i \times C_c$</td>
<td>7.38</td>
<td>6.99</td>
<td>6.40</td>
<td>5.72</td>
<td>4.87</td>
<td>3.86</td>
<td>2.67</td>
</tr>
<tr>
<td>Total Abortion Rate</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>0.83</td>
<td>0.67</td>
<td>0.50</td>
</tr>
<tr>
<td>Index of Abortion ($C_a$)</td>
<td>0.94</td>
<td>0.93</td>
<td>0.92</td>
<td>0.90</td>
<td>0.89</td>
<td>0.89</td>
<td>0.87</td>
</tr>
<tr>
<td>Implied TFR $TMFR \times C_i \times C_c \times C_a$</td>
<td>6.94</td>
<td>6.50</td>
<td>5.87</td>
<td>5.15</td>
<td>4.33</td>
<td>3.43</td>
<td>2.33</td>
</tr>
</tbody>
</table>

Table 8 summarizes these assumptions and their effect on levels of the total fertility rate. Assuming that the index of marriage remained constant at 0.6, the total marital fertility rate is 9.18 if the other proximate determinants have no fertility reducing effect. Assuming that the index of amenorrhea increases from 0.85 to 0.95 during the first stages of a fertility decline implies a reduction in its impact. Contraceptive use increases from
10 percent to 70 percent of women. At the same time the effectiveness of the method mix increases from 50 to 90 percent. The table also assumes that the total abortion rate remains constant at a level 1.0 abortions per woman until contraceptive prevalence reaches 40 percent, and then declines to 0.5. The initial level of abortion is assumed on grounds that less effective contraceptive methods are employed during the initial stages of increased contraceptive use, but are replaced by more effective methods later on, so that the need for abortion declines.

With these assumptions, the implied TFR ranges between values of 6.7 when contraceptive prevalence is 10 percent to 2.1 when it is 70 percent. Intermediate values in the table cover the range of experience observed in data for the three countries. With contraceptive prevalence in the 10-20 percent range, TFR varies between 6.3 and 6.7, which is approximately the level observed in the early 1960s. With prevalence at 50 percent, the TFR is 4.1, approximately the levels observed in the three countries in the early 1980s.

Explanations

Does anything approaching a common "story" emerge from the fertility decline experiences of these three countries? Analysis of the proximate determinants indicates significant change in at least one, and possibly two of Coale's three conditions for fertility decline -- access to the means of fertility control and/or motivation to use those means. On the supply side, the data suggest that before 1970 access to contraception in all three countries was limited to the private sector: private family planning organizations, private physicians, and commercial sales (with, or more often without a physician's prescription), and that the "market" for fertility control (with the possible exception of abortion) was a very restricted one.
After 1970, access to modern means of fertility control increased significantly, though the way in which it increased differed in the three instances.

In Brazil, the private sector accounted for most of the expansion in access to contraception during the 1970s. Commercial sales of pills played a major role. Sterilizations by private physicians also contributed, particularly in the last half of the decade. State level government intervention, in cooperation with the private family planning agency, promoted the spread of contraception in poorer states in the Northeast. In Colombia, public sector intervention came in the early 1970s, adding to, and eventually taking over the momentum that privately organized family planning programs had created during the late-1960s. Simulation exercises aimed at identifying the role of various sources of fertility control in fertility declines that occurred in Colombia between 1964 and 1975 suggested that public and private organized efforts contributed about equally to the 44 percent of overall decline in fertility that was attributed to these sources (Comite de Trabajo 1976) Commercial sales and private physicians continued to play a major role even while organized programs added to the overall supply. Recent survey data show that the share of organized sources declined during the last half of the 1970s.

Public sector intervention appears to have had the greatest impact on increasing access to family planning in Mexico, where access through the private sector (commercial and organized) had been weaker to begin with by comparison with Colombia and Brazil. Most of the increase in contraceptive prevalence tracked by surveys taken during the 1970s can be attributed to public sector programs. The Mexican experience is still too recent to determine whether a gradual shift to commercial sales and other private
sources may be occurring.

Is supply the key to the acceleration of fertility decline, as suggested by hypothesis A? If there was an unmet demand for family planning in the late 1960s, increased availability through a variety of sources would appear to have satisfied a substantial part of that demand during the 1970s: providing access to fertility control in instances where it was lacking or substituting cheaper and/or more effective means in instances in which traditional methods were known or available but not widely utilized. Survey data on knowledge and use of contraceptives in the capital cities during the mid-1960s suggest a large gap: in Rio de Janeiro, 93.5 percent of married women in reproductive ages knew of a method, but 32 percent were then current users; in Bogota the corresponding figures were 76 percent and 27 percent, and in Mexico City they were 77 percent and 25 percent (CELADE-CFSC 1972). World Fertility Survey data for Mexico showed a large gap between knowledge (90 percent) and current use (30 percent) for the country as a whole as late as 1978. Colombia's 1976 WFS showed 96 percent of women knowing about contraception and 42 percent currently using (Mamlouk 1982). Another measure of unmet demand for family planning in the WFS data is the percent of married women in child-bearing ages who want no more children: 61 percent of Colombian women wanted no more children, compared to 42 percent who were contraceptive users; in Mexico, 57 percent wanted no more children, compared to 30 percent who were current contraceptors (Kent and Larson 1982). The lower level of unmet demand for family planning in Colombia is a reflection of its earlier steps toward wider access to the means of fertility control.

The main problem with hypothesis A is that it does not exclude the possibility of changes on the demand side. In the experiences of these three countries, what suggests that such changes may also have been occurring is the
combination of (1) large socioeconomic class differentials in fertility and contraceptive use prior to the recently accelerated declines, and (2) the fact that the acceleration reflected/was made possible by the spread of fertility decline to regions and groups that had not experienced it earlier.

In addition to the regional and rural-urban differentials reported earlier, substantial socio-economic class fertility differences also characterized these countries before the onset of rapid aggregate level declines. Baseline data on class differentials are limited, but suggest that they may have increased prior to the onset of aggregate declines and narrowed since. Welti (1982) reports increasing educational class differentials in Mexico City between 1961-63 and 1973-75, which was the decade before the onset of national level decline in Mexico. Survey data for Colombia showed a 3 birth per woman differential in total fertility in 1967-68 between women with incomplete and completed primary education (Birdsall, 1979). By 1976 this differential narrowed to 2 births. More recent (1980) data are not exactly comparable because of differences in their educational classification, but age standardized differences in the number of births per woman appear to have narrowed to 1.2 births in a similar educational breakdown. In Brazil, the differential in total fertility between urban women with no education and those with 1-4 years of schooling narrowed from 2.2 births in 1970 to 1.6 in 1976 (Merrick and Berquo, 1983). Between 1970 and 1976, the greatest percentage decline in total fertility in Brazil occurred among lower income urban women.

What accounted for the persistence of high fertility among poorer and less educated classes and regions of these three countries until so recently? A basic point is that the development model which they followed between 1940 and 1970 offered few opportunities to the rural and urban poor
for achievement of upward economic mobility through smaller families. This model emphasized import substitution, with detrimental effects on agricultural development and income distribution because of the policies adopted to promote industrial development in the manufacturing sector. In agriculture, the majority of farm families had plots of land that were too small to support them. With little access to land or credit, their main economic opportunities were in off-farm labor, a risky proposition for the lone individual, but viable for the family unit that could rely on some members (more often women and younger children) to maintain the farm household while others worked off the farm. For the marginalized urban population, the family was also an important economic unit, both in securing jobs through family connections and in broadening the family economic base by having family members work in the informal sector. Neither situation, especially when combined with cultural attitudes about married women's economic activity outside the home, provided strong incentives for smaller rather than larger families.

Migration provided another outlet for pressures associated with rising population growth rates during the 1950s and 1960s. To the extent that migration provided an alternative demographic response to these pressures, it probably delayed the onset of fertility decline in rural areas. But it was also contributing to the eventual downturn in overall fertility rates, because it reduced the weight of higher rural fertility in national averages. Migration also fed the growth of the lower income urban populations among whom the spread of fertility control during the 1970s contributed so substantially to recent fertility declines. All three countries have experienced very substantial rates of rural-urban population redistribution since 1950, and cities have absorbed most of their population increase during the last 30
years. Between 1950 and 1980, the urban share of the total population increased from about one-third to over two-thirds.

Even so, shifts in the geographic distribution of the population account for only a small share of recent declines. More important are the changes that have been occurring within the different regions, particularly among the growing lower class urban population. While fertility declines were also occurring in rural areas, it was the urban groups whose weight in the overall total was increasing and without whose participation recent declines would not have been so rapid. Changes in social and economic status of those groups could have contributed to increased demand for fertility control, possibly as the effect of social mobility (changes in the proportion of women in childbearing age belonging to education and/or income classes with higher fertility versus those with lower fertility, as suggested earlier in hypothesis B1) or as an effect of changed socio-economic conditions on these groups, so that in addition to redistribution among groups, there could also have been pressures leading to changes within groups, as suggested in hypothesis B2.

Limited available data on fertility declines by socio-economic class suggest that there are elements of between group mobility as well as within group changes in all three cases. While there does not appear to have been a marked improvement in income distribution in any of the three countries between 1960 and 1980, there have been reductions in the proportion of women with no education, and overall increases in average educational attainment, with greater change in Brazil and Mexico than in Colombia. Table 9 is a compilation of data on the educational attainment of women in early childbearing ages during the early 1960s and late 1970s. As far as the data permitted, women in their twenties were grouped into three education
categories -- none, 1-5 years or primary level, and 6+ years or secondary level -- with exceptions noted in the table's footnotes.

The most striking shift between 1960 and 1980 occurred in Brazil, where the proportion with no education exceeded 40 percent in 1960 and dropped to 18 percent in 1980, while the secondary (6+) class increased from 9 to 37.5 percent. Mexico also had a comparatively high proportion (36 percent) in the "none" class in 1960, and experienced a decline to 18.7 percent in 1976. At the same time, Mexico shows a slight decline in the secondary (6+) class, probably because its (as well as Colombia's) 1976 survey relates to married women. They generally have lower average educational attainment than

Table 9. Distribution of Young Women by Educational Attainment.

<table>
<thead>
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<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>40.7</td>
<td>18.0</td>
<td>28.2</td>
<td>16.6</td>
<td>35.7</td>
<td>18.7</td>
</tr>
<tr>
<td>Primary (1-5)</td>
<td>50.2</td>
<td>44.5</td>
<td>61.7</td>
<td>60.8</td>
<td>41.3</td>
<td>61.1</td>
</tr>
<tr>
<td>Secondary (6+)</td>
<td>9.1</td>
<td>37.5</td>
<td>10.1</td>
<td>22.4</td>
<td>23.0</td>
<td>20.2</td>
</tr>
</tbody>
</table>


unmarried women, who delay marriage for educational purposes. A slightly older age break (25-34 rather than 20-29) was used to compensate for this, but that also leads to underestimation since those women are less likely to reflect recent increases in educational attainment. Colombia had the highest average level of educational attainment in 1960, with only 28 percent of women in the none category, and shows less change between 1960 and 1976 than Brazil or
Mexico, though the none group did decline to just below 17 percent, and the secondary category increased from 10 to 22 percent.

Comparing the three countries, Brazil appears to have presented the greatest opportunity for distributional changes to have contributed to fertility decline, since it had the highest initial proportion of women with no education. Columbia, with a lower initial level of women with no education, offered the least. Experience confirms that redistribution did, in fact, play a larger role in Brazil. For example, changes in the educational composition of the population accounted for 55 percent of the decline in children ever born among married urban women in Brazil between 1970 and 1976 (Merrick and Berquo 1983). A similar exercise for Colombia indicated that only 20% of declines between 1968 and 1974 could be attributed to the effects of changes in socio-economic characteristics (Comite de Trabajo 1976). Data were not sufficient to permit similar calculations for Mexico; however, data on fertility declines for roughly similar socio-economic groups in prevalence surveys suggest the Mexican experience has been closer to Colombia's than to Brazil's. Mexico is an interesting story in that the educational redistribution that occurred between 1960 and 1976 had little immediate impact on fertility, since the main fertility declines occurred after 1976. In a sense, this is also true of Colombia, since educational attainment was high compared to Brazil before the onset of Colombia's fertility decline, suggesting that in both Colombia and Mexico changes in the educational distribution were not sufficient conditions to trigger rapid declines in fertility. The existence of large difference in total fertility by educational level before the onset of declines suggests that more educated women had comparatively better access to fertility control as well higher motivation to practice it.
What is the significance of these changes in female educational attainment? Do they add up to a Latin American variant of the demographic transition, with its own special type of "modernization" of reproductive behavior? Evidence that fertility decline during the early 1970s was greater within lower income and education groups suggests that links between reproductive patterns and changing socio-economic conditions were more complex than linear "progress" as suggested by the modernization model. While increased education changed the balance between the costs and benefits of children at the household or "micro" level, there were also "macro" level social and economic changes affecting the conditions under which micro level choices were being made, either by broadening or limiting those choices.

The generally greater impact of within group changes raises the question of what made smaller families appear more advantageous to lower income and education groups after 1965 than before. Some aspects of the modernization argument in demographic transition theory are evident even if they are not labeled as such. For example, increased educational attainment, exposure to the mass media, and availability of new goods (from appliances to bluejeans) raised the consumption aspirations of low income groups, particularly in urban areas. Such changes represented increased participation of the population in the modern economy ("modernization"). These changes were not neutral with respect to fertility and family planning versus other types of behavior, nor did they guarantee equal opportunity to realize new aspirations.

In particular, two sets of societal/institutional level changes that were occurring during the late 1960s and early 1970s warrant attention. One set consists of the forces, already described, changing access to and attitudes toward family planning through expansion of commercial distribution systems and organized family planning efforts. Promotional activities of the latter
often influenced reproductive attitudes even if they were not the source of supply for a given user. The net effect of these changes was to reduce the monetary, time and psychological costs of controlling fertility. The other set consists of the combined impact of persistent income inequality and inflation, which put low income families in an economic squeeze, making it difficult for them to make ends meet, let alone realize increased consumption aspirations.

To put this in perspective, one needs to recall the 1950s, when the momentum of postwar import substitution sustained the growth of the larger cities that were attracting increasing numbers of migrants from smaller towns and rural areas. Real incomes of the urban working classes were growing, in part because price controls on food and other basics (public transport, for example) helped to maintain the buying power of their modest wages, and also because their growing political and economic power helped enabled them to maintain their relative economic position. By the early 1960s, import substitution lost momentum in Brazil; Colombia's and Mexico's problems appeared somewhat later. The roots of their problems were political as well as economic. Inflation, fed by the wage demands of urban working classes, played havoc with domestic and international economic relationships. Food production stalled, partly as a result of the disincentive effect of the price controls that had been aimed at keeping prices low for urban workers.

There has been considerable discussion and debate about long term trends in real wages in all three countries. Reliable empirical evidence on the purchasing power of low and middle income urban households is very limited. All three have set legal minimum wage levels for several decades. However, wage levels have been changed at irregular intervals and coverage under the legislation has been not consistent with respect to particular population
FIGURE 1. TRENDS IN REAL WAGES: BRAZIL, COLOMBIA, AND MEXICO
(THREE YEAR MOVING AVERAGES)

SOURCES: Brazil --- Sada, 1979; Colombia --- Perry, 1974 and Urrutia, 1981;
groups over time, making it difficult to draw firm conclusions from trend data. To the extent that the data are representative of any group, they reflect the experience of unskilled blue collar workers in manufacturing and construction. Low skill service jobs are also reflected in more recent data.

Much of the debate revolves around whether and how much the purchasing power of a day's work deteriorated, particularly in reference to the prices of such basic necessities as food. A number of authors have argued that real wages deteriorated: in Brazil, from the mid-1960s through the early 1970s (Bacha, 1979); in Colombia during the early 1970s and Mexico later in the 1970s (Berry and Soligo, 1980; Solis, 1983; Gregory, 1983). Figure 1 summarizes real wage trends from the 1950s through the 1970s. Three year averages of available data on minimum or blue collar wage indices are presented for each of the three countries. The Brazilian data show increases from the mid 1950s through the early 1960s, followed by steady declines until the early 1970s, when a very limited recovery begins. The turnaround in Brazilian wages occurs a few years earlier than the onset of rapid fertility decline that occurred in the mid-1960s. Colombia experienced rising real wages through the early 1970s, followed by declines during the early part of the decade, which is also the period of acceleration in Colombia's fertility decline. Mexico, in contrast, shows steadily increasing real wages until the late 1970s. The onset of fertility decline in Mexico occurred before the turnaround in real wages. Mexico's oil boom (1974-79) and the expansionary economic policies that accompanied it were instrumental in sustaining the rise in wages for a longer period. Since 1980, Mexico has also experienced declines in real wages.

Opinions about real wage trends are far from unanimous. Less pessimistic views on Brazil are found in Morley (1982), for Colombia in Urrutia (1981) and
Mexico in Gregory (1983). Some of their skepticism relates to the welfare interpretation of wage data. Household composition, in particular, mediates the impact of individual level earnings experiences on household income and consumption, since one way to compensate for deterioration in the real wages of the principle earner is to increase the participation of secondary earners when that is possible. This point has a direct bearing on the onset of rapid fertility decline. If the income/inflation squeeze is understood in general equilibrium terms, households adjusted to it by attempting to cut costs, increase income, and reexamine their priorities with respect to expenditure patterns. For households that were starting to shift their consumption patterns in the direction of "modern" goods mentioned earlier, the costs of children were competing with these aspirations. With fertility control becoming less expensive and more acceptable, one adjustment was to delay or decide not to have more children. Another was increased labor force participation by married women, again with potential competition in the use of time for child care.

One reason for the high degree of correlation between education and fertility is that increased education raises the value of women's time and creates opportunities for substituting work and earnings outside the home for such home-based activities as the rearing of children. In most of Latin America, female labor force participation rates have been low by comparison with other areas, particularly more industrialized countries. In part, this is a reflection of reporting practices that have understated the economic role of women. This leads to the reporting of very low participation rates for rural women, even though a very high proportion of them are engaged in home based artisan and subsistence agricultural activities. Increased urbanization initially brought even lower rates, since artisan manufacture gave way to
factory production, and few women were employed in the latter. Even with the expansion of urban services, female participation rates remained low in comparison to industrialized countries. Only during the last ten to fifteen years have female labor force participation rates in the region registered an appreciable upwary trend.

Data for Brazil, shown in Table 10, illustrate the point. In 1960 Brazil's female labor force participation rates exhibited the typical Latin American pattern identified by Durand (1976): rates that ranged between 20-25 percent for women in their late teens and early twenties, with declining rates at older ages. The same basic pattern emerges in 1970, though rates for women in their twenties increased by about 6 percentage points, suggesting the beginning of a new pattern in which peak rates occur at older ages. At the same time, Brazil's rates were far lower than in the United States, where the overall average was more than double that of Brazil, and higher rates continue at older ages, reflecting the return of married women to the labor force that has been occurring since the end of the Second World War. Patterns that are similar to Brazil are observed in Mexico, which had slightly lower participation rates than Brazil, and in Colombia, where rates were slightly higher (census dates were also 3-4 years later).

During the 1970s, Brazil experienced a significant rise in female labor force participation. Overall, rates increased by 10-15 percentage points, but more important, the main shifts occurred in peak childbearing ages. The 1980 rate for women aged 30-44 was nearly doubled that of 1960. It is important to note that the "increase" in female labor force participation in Brazil may reflect changes in reporting practices, since questions about economic activity in the 1980 census avoided some of the biases that led to underreporting of women in 1970 and earlier.
Table 10. Female Labor Force Participation Rates for Brazil, Colombia, Mexico, and USA.

A. All Women, Census Data:

<table>
<thead>
<tr>
<th>Age</th>
<th>Brazil 1960</th>
<th>Brazil 1970</th>
<th>Brazil 1980</th>
<th>Colombia 1964</th>
<th>Colombia 1973</th>
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</thead>
<tbody>
<tr>
<td>15-19</td>
<td>23.4</td>
<td>24.2</td>
<td>31.2</td>
<td>21.8</td>
<td>25.8</td>
</tr>
<tr>
<td>20-29</td>
<td>20.6</td>
<td>26.1</td>
<td>37.7</td>
<td>23.9</td>
<td>31.1</td>
</tr>
<tr>
<td>30-44</td>
<td>17.1</td>
<td>21.2</td>
<td>38.2</td>
<td>19.8</td>
<td>22.8</td>
</tr>
<tr>
<td>45-64</td>
<td>14.2</td>
<td>15.8</td>
<td>30.0</td>
<td>17.1</td>
<td>17.1</td>
</tr>
</tbody>
</table>

Age Mexico USA

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>15-19</td>
<td>20.7</td>
<td>20.9</td>
<td>27.6</td>
<td>52.9</td>
<td></td>
</tr>
<tr>
<td>20-29</td>
<td>19.9</td>
<td>21.1</td>
<td>40.0</td>
<td>40.6*</td>
<td>68.9*</td>
</tr>
<tr>
<td>30-44</td>
<td>17.1</td>
<td>15.9</td>
<td>40.3</td>
<td>54.7*</td>
<td></td>
</tr>
<tr>
<td>45-64</td>
<td>17.8</td>
<td>15.6</td>
<td>40.6</td>
<td>50.6</td>
<td></td>
</tr>
</tbody>
</table>

B. Currently Married Women, Survey Data:

<table>
<thead>
<tr>
<th>Age</th>
<th>Colombia 1976</th>
<th>Mexico 1976</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;25</td>
<td>18.5</td>
<td>13.5</td>
</tr>
<tr>
<td>25-34</td>
<td>28.3</td>
<td>19.9</td>
</tr>
<tr>
<td>35-44</td>
<td>28.7</td>
<td>25.2</td>
</tr>
<tr>
<td>45+</td>
<td>27.2</td>
<td>25.2</td>
</tr>
</tbody>
</table>

Sources: Note: Age groups are 20-24 and 25-44. Durand 1976; 1970 census data; Curtin 1982.
Recent census data are not available to confirm the presence of similar trends in Mexico and Colombia; however, survey data suggest that this is the case. Since the surveys include only currently married women, their female participation rates are not comparable with census data, which relate to all women. Rates for married women are typically lower than for all women. What is striking about the survey results is that rates for 1976 are higher than earlier observations for all women, and that they exhibit the same tendency toward increased participation of older women observed in Brazil.

Others (Potter and Alba 1983, Paiva 1983, Carvalho et al. 1982) have also noted that institutional factors that had favored larger over smaller families among lower income groups grew weaker during the 1970s. Particular emphasis is placed on both the way and the extent to which commercialization of agriculture and increased restriction of work opportunities to wage labor have influenced household resource allocation in rural areas. Potter and Alba suggest that the shift to wage labor in Mexico delayed fertility decline by providing an incentive for large families because more work options were available, but that these incentives dissipated when the rapid post-war expansion of Mexican agriculture lost momentum after 1965. In contrast, Parira argued that the expansion of wage labor in Brazil reduced the advantages of large families because there were fewer opportunities for children to work.

Underlying these contrasting examples, if indeed they hold up to further empirical testing, are important institutional differences in land tenure patterns that would have to be investigated. Of particular interest is the question of how women's participation in economic activity outside the home was related to these changes. Male proletarianization might have had different fertility implications depending upon whether married women with
children are or are not also involved in the shift to wage labor. These arguments help to explain declines in fertility in rural areas as well as migration from rural to urban areas.

Conclusions

The stories are still unfolding, and data are still being assembled for the task of providing a more complete explanation of the fertility declines that have been experienced in Brazil, Colombia, and Mexico since the late 1960s. An attempt to reach closure on the question would take us well beyond the scope of this paper, which has been an attempt to find common threads in their experiences. The data that we have examined support the view that both supply and demand factors have contributed to the recent acceleration of those declines. Analysis of the proximate determinants of fertility identified increased use of effective contraception as the main proximate determinant of these declines, though increased access to contraception resulted from the growth of a combination of channels rather than a single source. What suggests that demand was also important was that these declines were the result of a spreading of lower fertility to groups which had not previously participated in declines and whose weight in total population was substantial enough to influence national trends. While those weights have been increasing in recent decades as a result of geographic and social mobility, important changes were also occurring in behavior patterns within groups. Lower income and education classes in urban areas, in particular, contributed to the acceleration of fertility declines. These groups have, on the one hand, been increasing their consumption aspirations, and, on the other, experiencing increasing difficulty in realizing these aspirations on account of such macroeconomic forces as inflation and persistent income inequality. The paper
has argued that one of their adjustments to these pressures has been to reduce fertility, which has permitted them to allocate both time and monetary resources to other types of consumption, necessities as well as new goods such as appliances. Its account of the speedup of fertility decline thus focuses on the interrelation between micro-level changes in reproductive attitudes and behavior and macro-level social and economic changes, suggesting that the two sets of changes have played complementary roles in the acceleration of fertility decline in these three countries.

Brazil's experience offers the most support for the hypothesis that the onset of fertility decline was linked to increased economic pressures on lower income groups. Real wages fell dramatically during the late 1960s, the period when fertility decline accelerated, and without large scale public or private organized efforts to increase access to family planning. The case of Colombia is more difficult to interpret because the economic squeeze of the early 1970s coincided with the expansion of organized efforts to increase access to family planning. The two clearly had reinforcing effects on the accelerated fertility decline that occurred in Colombia after 1970, with a greater overall impact on fertility since total fertility was higher in Colombia than in Brazil to begin with, but fell more rapidly than in Brazil during the 15 years after 1965. It is interesting to speculate about how much lower Brazil's total fertility rate would have been in 1980 had Brazil followed the Colombian policy of organized efforts to increase access to family planning.

Mexico's experience is the most recent, and evidence about the acceleration phase covers a shorter time period. Data from Mexico's 1982 fertility survey suggest that the decline in total fertility in Mexico has caught up with Brazil and Colombia. Mexico's experience offers least support for the economic squeeze hypothesis, since real wages continued to rise in
Mexico until the late 1970s because of the oil boom. Fertility decline was underway by the middle of the decade. While the onset of the decline could have been linked to broader structural changes described by Potter and Alba (1983), the decision by Mexican authorities to provide public sector support to organized family planning clearly played a key role in the spread of contraceptive use to broader segments of the Mexican population. It is possible that the deterioration of economic conditions after the collapse of the oil boom has augmented the impact of the program on fertility (which would make it easier to understand the lower than expected level of total fertility reported in 1982), but it is hard to conclude that the onset of decline was linked to the economic turnaround rather than the program. The fact that the program and its effects on fertility anticipated the economic crisis and were then reinforced by it may have been the result of good foresight or good luck, but it could bring beneficial effects in Mexico's future efforts to deal with its many internal social and economic problems.
REFERENCES


CELADE-CFSC. 1972. Fertility and Family Planning in Metropolitan Latin America, Chicago, Community and Family Study Center, CFSC, The University of Chicago.

CEPAL, Comision Economica para la America Latina. 1982. Economia Campesina y Agricultura Empresarial, Mexico, Siglo XXI.


Colombia, Corporacion Centro Regional de Poblacion, CCRP, Ministerio de Salud de Colombia, and Westinghouse Health Systems. 1982. Second Contraceptive Prevalence Survey, Colombia, 1980, Bogota, CCRP.


Mexico, Consejo Nacional de Ciencia y Tecnologia, CONACYT. 1982. Investigacion Demografica en Mexico, 1980, Mexico, CONACYT.

Mexico, Consejo Nacional de Poblacion, COMAPO. 1982. Mexico Demografico Brevario, 1980-81, Mexico City, COMAPO.
Mexico, Consejo Nacional de Problacion, CONAPO. 1982. Mexico Demografico Brevario, 1980-81, Mexico City, CONAPO.

Mexico, Jefatura de Servicios de Planificacion Familiar. 1981. Fecundidad y Uso de Metodos Anticonceptivos en Mexico, Mexico City.

Mexico, Secretaria de Programacion y Presupuesto, Direccion General de Estatistica. 1979. Encuesta Mexicana de Fecundidad, Mexico City.


Ochoa, Luis Hernando, Myriam Ordonez, and Alberto Bayona. 1983. Perfil Socioeconomic y Demografic de la Poblacion Colombiana, Bogota, Corporacion Centro Regional de Poblacion, CCRP.


Footnotes

1. This paper is a shorter, revised version of a background paper prepared for the World Bank's 1984 World Development Report, which was prepared with financial support from the Bank. Several Bank staff members, particularly Ricardo Moran, William McGreevey, and Randy Bulatao, provided valuable comments and suggestions. The author alone is responsible for its views and errors it may contain.

2. See the notes to Table 2.

3. Underreporting may well be linked to fertility, since younger women who began a union as a consensual relationship could formalize it after the birth of a child, while women who were in consensual unions in their peak child-bearing years but have not had children may report themselves as "single" (meaning never married) if the union no longer exists by the time they reach age 40. It is also possible that the pregnancy or birth of a first child provides the circumstance that leads couples to enter into civil and religions marriages as well as consensual unions, since data on the mean age of entry into these unions and the mean age of first birth show that the differences between the two is generally less than nine months.

4. Bongaarts' index of postpartum amenorrhea (ci) measures the effect of breastfeeding on fertility in terms of a ratio that expresses the proportional reduction in total fertility attributable to postpartum infecundability. Index values based on Colombia's 1976 and Mexico's 1978 WFS data are identical -- 0.84. Values derived from Brazilian CPS data range between 0.85 and 0.97, and an attempt to construct a weighted average suggested a level of 0.91 for the mid-1970s (Merrick and Berquo 1983). The fertility reducing effect in these three countries is substantially less than in a number of South and Southeast Asian countries, where index values of 0.54 (Bangladesh), 0.58 (Indonesia) and 0.61 (Sri Lanka) have been reported.

5. For accounts of the import substituting industrialization experience in Latin America and its effects on agriculture and income distribution, see Furtado (1976).

6. Potter and Alba (1983) make this point in explaining why fertility decline was so late in coming to Mexico.

7. De Janvry (1981, p. 91) adds that migration adds to the motivation for having a larger number of births because as older children move away, younger ones are needed to maintain the stock of children working in unpaid family labor.

8. For example, recalculation 1980 fertility rates using 1960 rural/urban weights, Brazil's overall total fertility rate in 1980 would have been 5.1 rather than 4.3, Colombia's 4.1 rather than 3.6, and Mexico's would have been 4.6, compared to the observed level of 4.5 births.

10. See Wells (1977) for a discussion of the diffusion of consumer durables among lower income groups in urban Brazil. Merrick and Serrucho (1983) present data for inelaced ownership of TV sets among low income groups during the 1970s.

11. Brazil's industrial sector expanded at a rate of more than 10 percent per annum during the 1950s; from 1962 to 1967 the rate fell to less than 4 percent. During the subsequent recovery (1968-74) the rate of industrial expansion was well above 10 percent; however, the real income of industrial workers deteriorated under the wage policy that was adopted. Mexico experienced more rapid industrial growth rates during the 1960s, followed by a slowdown during the 1970s. Colombia's industrial growth rates did not reach levels attained by Brazil and Mexico. While the rate of growth slowed during the early 1960s, the recession was not as great as in Brazil (see Furtado, 1976, p. 152).

12. An illustration of the way that households in Brazil adapted to the earnings squeeze during the early 1970s is found in Sant'Anna, Merrick, and Mazumdar (1976). That study found considerable variation in the capacity to maintain household income levels according to family size, structure, and stages in the family life cycle. For example, households with small children and those headed by women were less likely to have income supplemented by the earnings of a secondary earner. The informal sector provided opportunities for secondary earners in cases where a household was able to rely on an additional member's work outside the home.

13. The logic of the relation between female educational attainment, labor force participation, and fertility has been spelled out in the extension of micro-economic theory that has been labelled as the "new home economics." Many Latin American social scientists object to that logic on the grounds that its emphasis on the inverse relation between rising education and declining fertility as part of a "modernization" process puts too much emphasis on rationalistic optimising by individual decision makers, with implications that "the market" is doing its work. The critics feel that the focus on individual behavior neglects overarching "structural" forces which limit the range of individual choice, and the "optimizing" has welfare implications which suggests that people are becoming better off in the process, when in fact they are having a very difficult time maintaining their living standard, or even experiencing a decline in welfare. In part, the difference in viewpoints is semantic, since "optimizing" is being confused with "optimal"; micro-economic theory does not preclude the possibility of optimizing in circumstances that require choosing the best possible allocation of resources when resources are shrinking.
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