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Who Benefits from Economic Growth? Work and Pay in Brazil, 1973-1988*

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Abstract

Does economic development benefit ordinary people in poor nations? Two authoritative surveys (N=89,811 and 84,389) in Brazil, a prototypical example, suggest that it increases the pay of all occupational groups, prosperous and poor, in roughly equal proportion, by about 3% a year. Most of this gain is due to compositional changes, especially the increase in educational levels; to more advantageous family background; and to migration to more prosperous regions within Brazil. The remainder, a growth of 1% to 2% per year, reflects the benefits of economic development *per se*. Development raises women's pay in equal proportion to men's.

Keywords

Growth, economic development, Brazil, inequality, disadvantage, women's pay, education, father's occupation

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Introduction

Economic development has reshaped the world, bringing unprecedented prosperity to the West and growing national incomes to many other nations; it remains, for governments throughout the world, a central goal of public policy. But there remain long-standing doubts about *who* benefits from economic growth, in particular whether the working class and the poor gain as much from it as the higher classes, or indeed whether they gain at all. At the beginning of Britain's industrial revolution, Malthus and Marx (in his earlier writings) thought they gained little, if anything. And this pessimistic vision continues, sometimes with supporting evidence, through dependency theory, world system theory, among many developmental economists of what might loosely be called a 'sociological' persuasion, among anti-globalization activists, and elsewhere (Bornschier and Chase-Dunn 1985; Bourguignon, Ferreira and Leite 2004; Brady, Kaya and Beckfield 2007; Feliciano 2001; Kuznets 1966; Pinheiro et al. 2001; Velez, Barros and Ferreira 2004; Wallerstein 1980). Firebaugh and Beck (1994) give a lucid exposition. However, there is also substantial evidence against such pessimistic views (Dollar and Kraay 2004; Firebaugh 1999; Firebaugh and Beck 1994; Szymanski 1983).

Portes and Roberts' admirably succinct summary probably reflects the current balance of opinion: orthodox economists expect that export oriented development policies lead to declining inequality while "the alternative (sociological) perspective" predicts "no decline in poverty and rises in inequality as economic benefits accrue to a minority of the population" (2005).

Also on the pessimistic side are persistent worries that economic development is too narrow a goal, neglecting broader and more important issues of human development (United Nations Development Programme 1996; Stiglitz, Sen and Fitoussi 2010; World Bank 2006). These goals, many embodied in the widely cited United Nations Human Development Index, are principally health, education, life satisfaction, and the alleviation of poverty in addition to simple increases in average income. Indeed some have argued that the reduction of inequality should be as much a target of government policy as simple economic growth (United_Nations 2013; World Bank 2006; but see Zagorski et al. 2013). But the issues are complex and it remains likely that increases in income are in fact the major source of improvements in health and in poverty reduction (Ravallion 1997). Moreover, there is no clear relation between poverty and inequality, or between economic growth and inequality (Dollar and Kraay 2004; Ravallion and Chen 1997), despite frequent assertions to the contrary (e.g. Velez, Barros and Ferreira 2004).

Economic growth entails consequences that are vital issues for world development policy and the alleviation of poverty in developing nations. Following the conventional wisdom of the past, economic growth has for decades been the primary priority for the government of less-developed countries and the overwhelming focus of development aid from advanced nations. But if that priority is misguided, past efforts have likely been suboptimal, perhaps even harmful, and new policies must be considered.

One reason these issues remain controversial is a scarcity of appropriate data. Most research uses aggregate data on nations' income distributions. A typical analysis infers the consequences of economic growth by comparing the income distribution at one time to the distribution at a later time (Dollar and Kraay 2004; Kuznets 1966; World Bank 2006). But this is seriously flawed because it does not control for other changes that confound the comparison, particularly the cultural (de Graaf et al. 2000; Evans et al. 2002, 2010; Kelley et al. 2014), cognitive (Kohn et al. 1990), family background (Meyer et al. 1979; Ganzeboom et al. 1991), and economic (Treiman 1970) changes leading to a steady growth of education and occupational skills, both major influences on income (Blau and

Duncan 1967; Hanushek and Woessmann 2008; Psacharopoulos and Patrinos 2002). For example, our data show that in Brazil the average education of unskilled workers increased by about 50% between 1973 and 1988, from two years to three. As in other developing nations, that increase, implies a 10% to 15% increase in earnings. Unskilled workers' family background also improved significantly, with more coming from literate and middle status families, implying a further increase in income.[1] Moreover, differential migration meant that more workers lived in urban areas, implying a further gain in income. Indeed, in the past two generations the Brazilian population shifted from two-thirds rural to four-fifths urban (Haller 2000). There were also shifts in regional composition between the developed South and the impoverished Northeast. Such factors need to be controlled to get a unbiased measure of the effects of economic growth. And that requires reliable, individual-level data on large, representative national samples. Such studies are urgently required (Ravallion 2001).

This paper offers one such study for Brazil, the largest nation in South America. While Brazil is often taken as a case study of economic development, we do not propose it as a pure example of any one style of economic development. Rather, it followed a mixture of policies, most of them familiar from other countries and most still widely recommended. Generalizability to other nations of course remains an open question.

Our aim in this paper is narrow: to assess the impact of Brazil's economic development between 1973 and 1988 on the income of different occupational groups. Understanding this is one small piece in the great mosaic of modern economic development. But it is an important and contentious piece, one subject to wide and varied speculation, and one whose answer has not yet been reliably ascertained. We take advantage of two authoritative surveys from the Brazilian census bureau's highly regarded PNAD series – among the best surveys available in the developing world. Both are large, representative national samples (N=89,811 in 1973 and 84,389 in 1988).

Theory

We will rehearse the theoretical issues only cursorily as the aim of the paper is to bring evidence to bear on an important and contentious issue, not to develop new theory. The answer we obtain is, however, relevant to many theories.

The Brazilian path to economic development in the period in the 1970s and early 1980s combined free market elements with a strong, economically active, authoritarian central government (Baer 2001; Bourguignon, Ferreira and Leite 2004; Fields 1977; Fishlow 1972; Haller and Saraiva 1992; Pastore 1982). In the 1960s and 1970s, it was what might be called 'State Capitalism' with the State controlling around half of the economy and actively pursuing a variety of policies to enhance economic development. Many other countries followed broadly similar policies at the time, and many still do today – including Pakistan, China, and Russia.

In addition to its purely economic aspects, the Brazilian case represents economic development in political circumstances generally unfavorable to the working class and the poor. The authoritarian government of the period was hostile to unions and to working class political movements. Most observers regarded it as beholden to Western powers; indeed Cardoso, a founder of dependency theory and much later Brazil's President, elaborated the theory to describe his own country (Cardoso and Falleto 1969). Income inequality was, and remains, among the highest in the world (World Bank 2006), although this is broadly in accord with Brazilian's own preferences (Evans and Kelley 2007).

[1] Family background has a direct impact on earnings in Brazil and many other developing nations.

The neo-classical economic thesis

The neo-classical economic model involves openness to foreign trade and investment, the rule of law, a sound currency, and policy stability in a fully competitive market, with capital flowing freely between sectors in search of the highest rate of return (Schultz 1980). Over a span of decades development will raise productivity, and hence standards of living, for all – and, indeed, raise them faster than development could in past centuries because technology is more advanced and imported capital is cheaper than in the past (Romer 1990). All that raises productivity and, hence, income for all. In the long run, a competitive market ensures equal marginal returns to investments in each form of capital and each level of education.

In the short run, whether benefits go mainly to jobs that embody many skills or few depends on the "race between education and technology" (Jacobs 2004; Tinbergen 1975). If technology and capital investment increase the demand for trained workers faster than schools increase the supply, the returns to skill will go up; if the race is equal, returns will not change; and if schooling wins the race, returns to skill will go down (as is historically the case in many Western nations). A short-run disequilibrium due to a shortage of human capital can have important consequences for earnings (e.g. Kelley and Klein 1977, 1982). But in the longer run, competitive forces will increase the supply of education and skills (Hanushek and Woessmann 2008) to once again equalize the returns to all forms of investment. So:

> *Neo-classical economic hypothesis:* In the long run in a free market, all – capitalist and worker, skilled and unskilled, farm and non-farm, will gain from economic development in roughly equal proportion.[2]

Although Brazil followed the neo-classical model only in part – the large 'state capitalist' sector was a major departure – large parts of the economy did fit the neo-classical model. We will see that the distributional outcome also fits the neo-classical prediction, at least in part.

Rejected alternative theories

Many would argue that neo-classical theories do not apply to developing nations, or at least not to large parts of their economies. There are several important arguments, all of which conflict with the neo-classical hypothesis (and all, we will show, undermined by the Brazilian experience).

Population growth and the decline of agriculture: A highly pessimistic view – one predating the neo-classical theory but still echoed by modern advocates of zero-population growth and by some environmentalists – is that population growth puts unsustainable pressure on the fixed stock of agricultural land, forcing many farmers' children off the land into the non-agricultural labor market (Malthus 1978 (1826); however, see Simon 1986). The resulting surplus of unskilled, poorly educated labor drives their wages down for conventional supply-and-demand reasons, while increasing the returns to (relatively scarce) land and capital.

Pessimistic political theories:[3] Skepticism about the benefits of economic development, particularly that produced by foreign investment, has been around for a long time, and not only among Marxists,

[2] See, for example Dollar and Kraay. (2002); Schultz(1980). In some circumstances, neoclassical reasoning suggests that low-skilled workers in developing nations should gain disproportionately. Specifically, the Hecksher-Ohlin theory argues that international trade increases demand for unskilled labor in capital-poor less developed nations, so improving their economic conditions.

old line socialists, and dependency theorists, but also in more mainstream arenas (e.g. World Bank 2006). One leading suspicion is that such development as is possible under the domination of core nations and multinational companies benefits only co-opted local elites and a small blue-collar 'labor aristocracy', leaving the majority of the workforce no better off.

Dual economy and segmented labor markets: The influential dual economy and segmented labor market theses maintain that developing countries typically have two rather separate economies – one modern, capital-intensive, productive, and offering high wages (the modern or core sector) and the other traditional and labor intensive, with low productivity and poor pay (the traditional or peripheral sector). Economic growth occurs in the core sector, as in the neo-classical analysis, but the peripheral sector remains largely untouched. The result is that development's benefits flow only to one sector, usually a small fraction of the labor force and fail to reach the majority in traditional, low technology, often agricultural jobs (Doeringer and Piore 1971; Hodson and Kaufman 1982; Pastore and Haller 1982; World Bank 2006). The gains of development thus go primarily to educated employees in skilled jobs, particularly professionals, administrators and skilled manual workers.

Background

The core issues are thus clear-cut, but bringing good evidence to bear on them is not entirely straightforward. The simplest approach, which we follow here, is historical: comparing a nation at early and later stages of development.[4] The key assumption is that differences between time periods are due mainly to industrialization and the growth of education – for example, that differences between the Brazil of 1973 and the Brazil of 1988 are mainly due to that. Religion, culture and norms are much the same throughout the period, and laws and government regulations changed only slowly. The main changes in the international economic environment were the first and second oil shocks in 1973 and 1979 which slowed growth (Baer 2001). Assuming away these and other unmeasured changes and attributing differences to time and economic development is problematic, although on balance justifiable and often done (e.g. Kuznets 1966; World Bank 2006). Historical analyses rarely have detailed, reliable data on income from successive representative samples of a nation's population. But our analysis is particularly fortunate in this respect, with excellent data collected by Brazil's census bureau (Pastore 1979; Pastore and Silva 2000). Of course, there are the inevitable uncertainties in extrapolating from any one country and any one historical period.

The Brazilian context

Brazil remained a poor, pre-industrial society until the middle of this century (Baer 2001). After many years of sustained growth following World War II, the economy was shaken by the political crisis of the early 1960s and growth in GDP had virtually stopped by 1963. Following the military takeover in 1964, the new government adopted an avowedly capitalist economic policy. Brazil downgraded a rigid system of tariffs, quotas, and artificial exchange rates, which had insulated industry from external competition, established a realistic exchange rate, and encouraged investment and exports (Baer 2001). The result was a sustained period of rapid growth in manufacturing, employment, and real wages, which doubled GNP within a decade and was widely hailed as the 'miracle decade'. By the

[3] There are also optimistic views of politics, holding that well-intentioned government intervention in development policy can improve matters for the working class (World Bank 2006). The Brazilian case does not speak to this possibility since the government in power in our period made few such attempts.

[4] An alternative approach is cross-sectional, comparing more developed and less developed regions in Brazil. Analyses using this approach (Haller et al. 1982; Kelley and Haller 2001) reach conclusions strikingly similar to this paper.

early 1970s, GDP was growing by 10% to 14% annually. Market reforms in China had a similar effect (Nee 1991). A global oil crisis struck in 1973 – the time of our first survey. GDP growth fell to a little under 7% from that year to 1986, slower but still comparatively rapid by world standards. By the end of the 1980s, GDP per capita had increased by at least a third over 1973.

As of 1973, when the first wave of the present data were collected, Brazil was unique among less developed nations in two important ways, one concerning development, the other concerning the quality of socioeconomic data describing the population. First, the seeds of Brazil's developmental spurt in agriculture – the origins of its present position as a world leader in export agriculture – had just been planted in 1972. Agricultural research and extension services were federalized, new crop-specific regional research institutions established, and large numbers of carefully picked Brazilians sent for doctoral training in the best university departments of agriculture in the United States.[5] The high technology revolution (Evans 1995), among other things producing Brazil's world leadership in the manufacture of mid-range passenger aircraft, had its origins in this period as well. It built on the prior development of automobile industry, in which foreign companies took the lead, that resting in turn on the steel industry initiated in World War II. In short, the early 1970s to the late 1980s is the period in which Brazil's development spurt was incubated. Thus, our data from 1973 and 1988 are at the beginning and ending of an unusually important period in Brazil's history of development.

Second, Brazil was unique in the quality of the data it had begun to obtain on itself, undoubtedly the best in the developing world at that period and equal in quality to those of the richer nations of North America and Europe. Around 1969, the government reorganized its previously inefficient national statistical system, the Brazilian Institute of Geography and Statistics (IBGE). It reworked the poorly done population census of 1960, conducted a thoroughly modern census in 1970, and with the advice of specialists from the University of Michigan, initiated a series of immense annual household sample surveys (Pesquisa Nacional por Amostragem de Domicilios). These are probability samples of households, with data on each individual person in the household. Each includes questions common to all PNADs, together with its own special focuses. The PNADs of 1973 and 1988 are devoted to the socioeconomics of income and work. The evidence used in this paper is from them (IBGE 1988).

Toward the end of this period, the military government gradually began to relinquish control through an unannounced stepwise program called the 'abertura' (the opening). By 1985 it installed a make-shift civilian government which remained in power until the new constitution of 1988 established the present democratic form of government. The politically unsettled years between 1985 and the emergence of stable and effective economic policies under Cardoso in 1994 were also a period of vacillation, drift, and uncertainty in economic policy (Baer 2001). Just as in earlier political crises, the immediate aftermath was weak economic growth for some years. So 1988 – the time of our second survey – is a convenient stopping point near the end of the long period of 'State Capitalism'. For further details, see (Baer 2001 [the classic account]; Barros, Henriques and Mendonca 2000; Bourguignon, Ferreira and Leite 2004; World Bank 2006).

Data and methods

The national household probability sample surveys (PNAD: Pesquisa Nacional por Amostragem de Domicilios) are conducted annually with a different focus each year. The PNADs used here, 1973 and 1988, are among the few with the necessary family background information. These surveys are

[5] The commission that wrote the 1972 plan, and subsequently many of the leading administrators in the new system consisted mostly of American-trained sociologists and economists.

conducted by the Brazilian census agency, the Instituto Brasileiro de Geografia e Estatistica (IBGE). The highly regarded PNAD data are collected by IBGE's well-trained interviewers using a multistage area probability sample that covers the resident non-institutional population throughout Brazil, only excluding remote rural areas in the Amazon forest. Persons in the sample are required by law to complete the questionnaire. For this analysis, we restricted the sample to men and women in the prime working ages (20 to 64), who are in the labor force, were not unemployed,[6] have positive earnings, and answered all the key questions (except father's occupation where missing data are treated as described below). Very young workers and workers over 64 raise problems that require special treatment, which we defer for separate publication. With these restrictions, there are 89,811 cases in 1973 and 84,389 in 1988. For 1973, the census bureau made a special tape for this project.

The 1973 survey is the earliest available. The 1988 survey, one of the few others with the necessary family background information, comes conveniently near the end of the long period of neoliberal economic policies that commenced with the 1964 military takeover and continued under the authoritarian governments that followed. Afterwards, the 1988 constitution reestablished democratic government, leading to a diverse and changing set of economic policies in subsequent years (Baer 2001).

Measurement

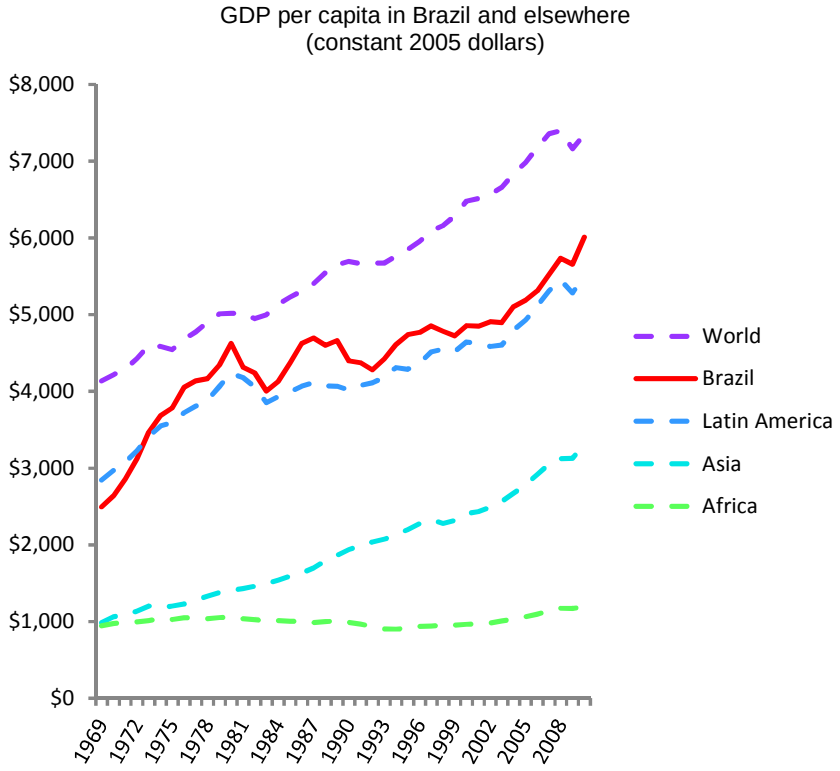
Economic development: The broad pattern of economic development in Brazil is very similar to that elsewhere in Latin America with strong growth in the 1970s, a brief downturn in the early 1980s, and clear if somewhat erratic growth thereafter (see figure 1, next page). By the end of our 1973-1988 period Brazil's GDP per capita was close to its long-term trend. In all it grew by 33% in the period covered by our survey data. This was somewhat faster than in the rest of Latin America.

We assume that changes over time in Brazilians' incomes between 1973 and 1988 – once differences in family background, education, occupation, region of residence, and other individual variables are controlled – reflect the results of this economic development. The assumption that income changes over time largely reflect development is usual in the literature and, we think, reasonable in the Brazilian case. There were no unusual changes in this period – no oil boom for example – and Brazil seems to follow the same general patterns of development found elsewhere in Latin America.

Income: Our income data are from a detailed series of questions giving an unusually accurate and complete estimate. The cost of living is lower in the Northeastern region of Brazil by, we estimate, between 8% and 16% (Fishlow 1972). To adjust, we therefore deflate incomes in the rest of Brazil by 12%, the midpoint of our estimated range. Despite the detailed questionnaire and well-trained interviewers, there are of course some uncertainties with income, particularly income in kind among poor farmers and investment income among the rich. But experience with the PNAD data suggests the biases are small. And in any case they are much the same in 1973 and 1988, and so will cancel out in the analysis. For simplicity, we speak of "earnings" and "income" interchangeably; few working age Brazilians had any appreciable unearned income.

[6] About 3% of the labor force was unemployed in 1988 and even fewer in 1973. Unless they are infirm, all working age adults expect to be employed, either in paying jobs, in household activities, or in a few cases in school (although many students are also employed). Being unemployed is defined by law as out of work and looking for a job for one week. The unemployed in 1988 were not asked occupation or income. In 1973 they were asked their "usual" occupation and income, reporting income levels roughly 75% of comparable employed workers in the same occupations, presumably because spells of unemployment were usually brief. For comparability, we omit them from the analysis in both years. Unemployment is not strongly correlated with variables in the model, so this omission makes little difference to the results.

Figure 1. GDP per capita in Brazil in comparative perspective, 1969-2010



Source: USDA Economic Research Service International Macroeconomic Data Set

Income is measured in multiples of the minimum wage (*salarios minimos*), which is usual in Brazil. The value of the minimum wage is established by law based on the cost of a market basket of goods calculated to sustain an urban family of two adults and two children at a modest but acceptable level. One minimum wage was worth US $1,309 per year in 1988 at parity purchasing power. Inflation in Brazil has historically been high and variable – 14% in 1973 and 891% in 1988 – and wages were set in multiples of the minimum wage. The money value of the minimum wage is adjusted regularly, in theory keeping its purchasing power constant.

Because of the hyper-inflation in 1988, there is some uncertainty in converting income in currency units into minimum incomes. Since the survey was carried out at the same time throughout the country, the uncertainty does *not* have to do with the income of one group relative to another, but solely with the overall level of income for the country as a whole. We have therefore adjusted the survey figures to correspond to the economy's actual growth in purchasing power per capita between 1973 and 1988, on the assumption that growth in the labor force's earnings paralleled growth in GDP per capita. We estimate growth in GDP per capita at 55% over the period, about 3.3% a year (Baer 1989: 102; World Bank *World Development Report*, various years).

To adjust for differences in hours worked and so focus more directly on productivity, we annualize income to reflect the earnings of full-time, full-year workers. We do this by first computing hourly pay and then multiplying up to full-time (45 hours per week) and full year (52 weeks). This adjusts upward the earnings of part-time workers (note that 11% of the labor force, mainly women, worked less than 35 hours per week), makes little difference in the full-time range, and adjusts downward the earnings of those who worked long hours (34%, mainly men, worked over 50 hours a week).

Poverty and wealth: The minimum wage represents the official poverty line, close to the frequently used $1 per person per day international poverty line (World Bank 2006). Inasmuch as it is defined in terms of a family of four, we confine our attention to married men when analyzing poverty (or wealth). Our focus here is on income – that is, on what the economy produces – not on welfare per se or on demographic and family patterns. We, therefore, we make no adjustment for family size or spouse's income.

Wealth is defined somewhat arbitrarily as having more than ten minimum wages.[7] That is roughly 5 times what the average Brazilian earned in 1973 and 10 times what farm laborers earned.[8]

Occupation: Taking advantage of our large samples, we use 16 narrowly defined occupational groups rather than broad aggregates, such as the 'working class'. At the cost of some complexity, this has the great advantage of catering for the possibility of differential effects on different segments of the labor force, as well as avoiding definitional dilemmas about just how classes should be defined by giving sufficient detail to cater to all common possibilities.

The underlying data are detailed three-digit Brazilian census codes supplemented by separate questions on ownership and number of employees. We capture the main variations in status and standard of living by recoding these into Treiman's (1977) Standard International Classification of Occupations (based on International Labor Office [1968] major groups, further subdivided by occupational prestige). Treiman's classification has proven highly discriminating for cross-cultural analyses in general and for Latin America in particular (Kelley and Evans 1995). We extend it to include Marxist distinctions based on ownership and number of employees, distinguishing owners and the minor bourgeoisie (e.g. Robinson and Kelley 1979; Kelley and Evans 1993). We further refine these categories, distinguishing white-collar from blue-collar owners and petty bourgeoisie. The result is a scheme that we believe effectively captures the major differences among occupations. It is a more discriminating classification than either Treiman's original or the simpler Goldthorpe-Erickson scheme (Kelley 1990). The questions asked in the 1973 and 1988 surveys are not identical, so there are some (mostly small) problems in comparability.[9]

Large farmers are defined as those with paid employees (the data available did not permit narrower distinctions). Family farmers are those owning a farm but not employing paid labor. Farm laborers

[7] This is wealth in the colloquial sense of having a high income, not in the more precise economists' sense of having a lot of assets. We use the colloquial for convenience of exposition, with apologies.

[8] For comparison, five times what an average American earns today would be over $200,000 a year.

[9] Comparing the same cohorts in the two surveys suggests that comparability is mostly good except that the "technical, higher clerical and higher sales group" is perhaps overestimated in the 1988 classification. A further difficulty is that the 1988 questionnaire does not allow a clear distinction to be made between family farmers and farm labourers. For comparability, we have therefore combined the two categories in the 1973 survey as well. The 1988 questionnaire also lacks an ownership variable for father's occupation, so some distinctions that we make for respondents cannot be made for fathers.

and sharecroppers make up the remainder. Unfortunately, they cannot always be distinguished from family farmers in the 1988 classification.

Father's occupation: This is coded in the same way as respondent's, except that information on ownership is not available in the 1988 survey. For comparability, we do not use it for the 1973 data either, so the occupational classification for fathers omits Marxist distinctions based on ownership. There is substantial missing data for father's occupation, partly (but not entirely) because in 1988 father's occupation was asked only for heads of household – for others it had to be extracted from family records and was unavailable for retired, unemployed, absent, or deceased fathers. We, therefore, include an indicator variable for missing data on father as a control in the analysis. In practice, its effects are small and including it makes no discernible difference to the results.

Education: Schooling is measured by a series of five indicator (dummy) variables for highest level completed: no schooling (the reference category), primary, elementary, junior high, high school, and university. Haller and Saraiva (1992) gave details.[10] Some analyses treat education as a metric variable, scored according to the usual number of years needed to complete it.

Gender: The earnings patterns for men and women differ substantially, with women earning much less than comparable men. To cater for these complexities, we estimate all models separately for men and women.

Control variables: There major regional differences between the less developed Northeastern regions of Brazil and the prosperous southern regions (Haller 1982; Haller 2000), as well as between the more prosperous cities and poorer rural areas; similar differences are found in many developing nations (World Bank 2006). To cater for these, we include an indicator variable for **region of birth** and another for **urban vs. rural** residence. In Brazil, as in many other nations, married workers earn more than single ones, so we include an indicator variable for **marriage**. As virtually everywhere else in the world, labor force experience has an important effect on earnings. We, therefore, include years of **labor force experience** and, to cater for the usual curvilinearity, **labor force experience squared**. Race is not available in the 1973 survey so we exclude it from both.

Methods

We compare outcomes in 1973 and in 1988 using regression standardization methods to adjust for differences in family background, education, labor force experience, marital status, urban residence, region of birth, and gender. We eschew strong assumptions about measurement by using extensive sets of dummy variables. We eschew strong assumptions about linearity and interactions by estimating the model separately for men and women (so allowing all possible interactions between gender and the variables in our model) and separately for each time period (so allowing for all possible interactions between time and the variables in our model).

Income model: There are clear income differences between men and women in Brazil, as in many other nations. In addition, the effects of education, labor force experience and some of our control variables differ for white-collar, blue-collar, and farm occupations. For example, education provides greater returns in white-collar and (surprisingly) in farm occupations where each year increases

[10] Before 1972, Brazil's education system was organized into 5 main groups: less than one year; primary (4 years); Medio 1 (5 to 8 years); Medio 2 (9 to 11 years); and university (mostly 15 years). In addition, some students finished one level and started the next but did not complete it. To keep a reasonable number of cases in each category, we combined Medio 1 incomplete with primary; Medio 2 incomplete with Medio 1; and university incomplete with Medio 2. A new system was established in 1972, but our respondents had almost all studied under the old system.

earnings by 9% or 10% (Neves 2005). Labor-force experience matters more in white-collar and less in blue-collar occupations. Regional differences are smaller for farm occupations than for others. We therefore estimate the income model separately for these 3 occupational groups. So in all, there are 6 separate models for 1973 (3 occupational groups for men, 3 for women, all estimated on 1973 data) and 6 more for 1988, for a total of 12 models. Specifically, for each group, k, in 1973 we estimate:

$$Income_{1973,k} = b_{0k} + b_{1k}Region_{73k} + b_{2k}Urban_{73k} + b_{3k}Married_{73k} + b_{4k}Experience_{73k} + b_{5k}ExpSquared_{73k} + \Sigma_i\, b_{ik}\, FathersOccupation_{73k} + \Sigma_j\, b_{jk}\, Education_{73k} + \Sigma_m\, b_{mk}\, Occupation_{73k} + e_1$$

$$= b_{1973,k}\, X_{1973,k} \quad where \;\; X = [\, Controls|FathersOccupation|Education\,|Occupation\,] \qquad (Eq.\ 1A)$$

We estimate corresponding equations for each of the other six groups. Income is the natural log. Taken together, these six equations capture the pay regime prevailing in 1973.

We proceed analogously for 1988:

$$Income_{1988,k} = b_{1988,k}\, X_{1988,k} \quad where \;\; X = [\, Controls|FathersOccupation|Education\,|Occupation\,] \qquad (Eq.\ 1B)$$

We then use these equations to estimate what the 1973 population would have earned if they too had been subject to the 1988 pay regime by applying, a group at a time, the 1988 regression coefficients to the 1973 population:

$$Adjusted\ 1988\ Income\ for\ group\ k = b_{1988,k}\, X_{1973,k} \qquad (Eq.\ 2)$$

We convert these log income figures back into minimum wage units by taking the exponent and averaging.

The gain due to industrialization for a particular group of workers, for example unskilled blue-collar workers, is the ratio of this adjusted income to the income they would have received under the 1973 regime:

$$Gain\ from\ economic\ development\ for 1973\ group\ k = b_{1988,k}\, X_{1973,k} \,/\, b_{1973,k}\, X_{1973,k} \qquad (Eq.\ 3)$$

We convert that to average annual compound percent growth for the 15 years between the two surveys on the assumption that the rate of growth was constant throughout the period.

Gains from compositional changes are reflected in the difference between the observed growth in income without making any adjustments and the growth due to industrialization as estimated from Eq. 3. These changes include favorable shifts in the occupational distribution, the more advantageous family background and higher educational levels of 1988 respondents, migration to more developed regions in Brazil, and the like. There are a number of seemingly attractive ways of further dividing up these gains (e.g. the Blinder decomposition), but closer analysis shows most depend on inherently arbitrarily choices in the model's parameterization and so must be eschewed (Jones and Kelley 1984).

These methods are a generalization of those familiar from the analysis of discrimination, analogous to estimating one income equation for the majority group and another for the minority group (Jones and Kelley 1984; Kelley and Evans 1995). The use of the 1973 population as our reference population is preferable to the more usual choice of a single (necessarily arbitrary) point of comparison.

Description

The Brazilian labor force, 1973-1988

Occupational composition: In 1973, Brazil's labor force – like most other nations' at that level of development – had a large agricultural sector (32%), a large blue-collar sector (41%), and a smaller white-collar sector (28%) (see table 1, column 1, next page). The range of blue-collar jobs was broadly similar to that found in other nations, with a preponderance of semi-skilled workers, a large blue-collar petty bourgeoisie (Myles and Turegun 1994), and a small group of blue-collar entrepreneurs with their own businesses and employees. The range of white-collar jobs was also similar to that of other nations, with many routine clerical, petty bourgeoisie occupations, and mid-level technical jobs, a few lowly routine sales jobs, and a small number of elite of managers, business owners and professionals.

Over the 15 years to 1988, the agricultural sector declined by half (table 1, column 2). Blue-collar jobs increased. Lower status white-collar jobs also increased.[11] Higher status while-collar jobs remained stable or declined.

Family background: Over the same period, family background became steadily more favorable, as the benefits of past growth flowed through the population (table 1, columns 3 to 5). For example, at the beginning of the period unskilled service workers had fathers whose occupations averaged just 9 status points compared to 12 decade and a half later, a growth of around 2% per year. There were similar improvements throughout the farm, blue-collar, and lower white-collar ranks, and smaller gains among the higher white-collar ranks. Overall, the gains averaged 2% or 3% a year.

Education: In this same period, between 1973 and 1988, educational levels also increased by around 3% a year (table 1, columns 6 to 8). Unskilled service workers, for example, increased from an average of 2.8 years to 3.6. The gains were proportionately higher in the white-collar ranks, save only for routine clerical workers whose standards actually slipped a little.

Changes in income, 1973-1988

In 1973, Brazil was poor, with GNP around the level the USA reached in the 19th century.[12] The poorer Northeastern region was around the level the USA reached in 1850 while the richer Southern region was similar to the USA in 1890 (Haller 1982). The patterns we observe thus reflect the earlier stages of economic growth, but not the very beginning. Many other nations in the 1970s were at a similar level of development, including Korea, Malaysia, Mexico, Peru and Portugal.

Brazil also has a famously unequal income distribution (World Bank 2006), although broadly in accord with what Brazilians think proper (Evans and Kelley 2007). It was unequal in 1973 and remained unequal in 1988 (table 1, columns 9 and 10; figure 2, p.14).

On average in Brazil (as elsewhere in the world), higher professionals were the best paid followed closely by managers and white-collar entrepreneurs (figure 2, upper right). Then there was a large gap followed by blue collar entrepreneurs and large farmers. Higher white-collar jobs came next, followed by blue collar occupations and family farmers. Note that large farmers in Brazil were not rich, with incomes on average hardly half that of higher professionals.

[11] The rapid growth of technical, high clerical and high sales occupations is probably exaggerated by changes in the occupational classification in 1988.

Farmers: In 1973, family farmers and farm laborers – the largest and poorest occupational group in Brazil – earned on average just 1 minimum income (table 1, column 9). By 1988 their earnings had increased to 1.4 minimum wages, a gain of 40% or about 2.5% per year (columns 10 and 11).

Table 1. Description, Brazil, 1973 and 1988. Occupational distribution, father's status, respondent's education, respondent's income, and annual percent growth in these.[1] Men and women, age 20 to 64, in the labor force and with positive earnings. N=89,811 and 84,389.

	Percent distribution		Father's occupational status (mean, 0-100)			Respondent's education (mean years)			Income (mean # minimum wages)			Poverty % (<1 minimum wage)			Wealth % (> 10 minimum wages)		
Respondent's occupation	1973 [1]	1988 [2]	1973 [3]	1988 [4]	Annual % growth [5]	1973 [6]	1988 [7]	Annual % growth [8]	1973 [9]	1988 [10]	Annual % growth [11]	1973 [12]	1988 [13]	Annual % growth [14]	1973 [15]	1988 [16]	Annual % growth [17]
Farm:																	
1 Farm laborer, family farmer	28	16	1	2	*3.1*	1.3	2.0	*2.7*	1.0	1.4	*2.5*	65	38	*-3.5*	0	2	-- [2]
2 Large farmer	4	1	5	7	*2.9*	3.0	5.1	*3.6*	4.1	11.4	*7.1*	22	6	*-8.5*	10	32	*8.2*
Blue collar:																	
3 Unskilled service	9	8	9	12	*2.1*	2.8	3.6	*1.7*	1.0	1.1	*1.1*	13	13	*0.1*	0	0	-- [2]
4 Unskilled industrial workers	5	3	8	12	*2.6*	2.4	3.5	*2.4*	1.3	1.7	*1.8*	22	15	*-2.7*	0	1	-- [2]
5 Blue collar petty bourgeoisie	9	10	11	13	*1.5*	2.8	4.0	*2.6*	1.6	2.4	*2.9*	26	11	*-5.7*	1	6	-- [2]
6 Semi-skilled workers	12	14	11	14	*1.5*	3.2	4.2	*1.9*	1.8	2.5	*2.2*	7	7	*-0.6*	0	3	-- [2]
7 Skilled workers	6	9	16	16	*0.1*	4.4	5.4	*1.4*	2.6	3.2	*1.2*	3	4	-- [2]	3	7	-- [2]
8 Blue collar entrepreneur	1	1	15	25	*3.6*	3.7	8.1	*5.4*	3.9	11.3	*7.3*	6	1	*-11.6*	6	41	*14.1*
White collar:																	
9 Routine sales	3	3	19	25	*2.0*	5.0	7.3	*2.5*	1.7	2.4	*2.3*	12	6	*-4.3*	1	6	-- [2]
10 White collar petty bourgeoisie	5	7	14	22	*3.2*	4.0	6.4	*3.3*	2.8	5.2	*4.3*	24	7	*-7.7*	5	18	*8.9*
11 Routine clerical	6	2	30	24	*-1.6*	8.2	7.6	*-0.5*	3.0	2.8	*-0.4*	3	2	-- [2]	6	4	*-3.0*
12 Technical, hi clerical & sales	5	18	27	31	*0.8*	8.4	10.5	*1.4*	3.4	5.7	*3.5*	4	1	-- [2]	15	26	*3.4*
13 White collar entrepreneur	3	2	28	31	*0.8*	6.8	9.4	*2.1*	7.7	12.1	*3.1*	3	0	-- [2]	26	50	*4.5*
14 Managers & administrators	3	2	35	36	*0.1*	9.3	11.8	*1.6*	8.4	14.5	*3.7*	1	1	-- [2]	35	56	*3.3*
15 Higher professional	3	3	41	45	*0.6*	12.5	14.2	*0.8*	9.2	15.4	*3.5*	1	0	-- [2]	46	74	*3.2*
Total:	100%	100%	12	18	*2.6*	3.8	6.0	*3.0*	2.4	4.0	*3.5*	30	13	*-5.5*	5	12	*5.7*

[1] Income is expressed as multiples of the official minimum wage, which is the cost of a market basket of goods adequate to sustain an urban family of four, equal to $1309 per annum in US dollars of 1988 at parity purchasing power. Poverty and wealth figures are for married men. Poverty figures are somewhat overstated since they neglect wife's earnings. Wealth figures are somewhat understated for the same reason.
[2] Percent growth in the last two panels is shown only where the baseline is at least 5% of the population.

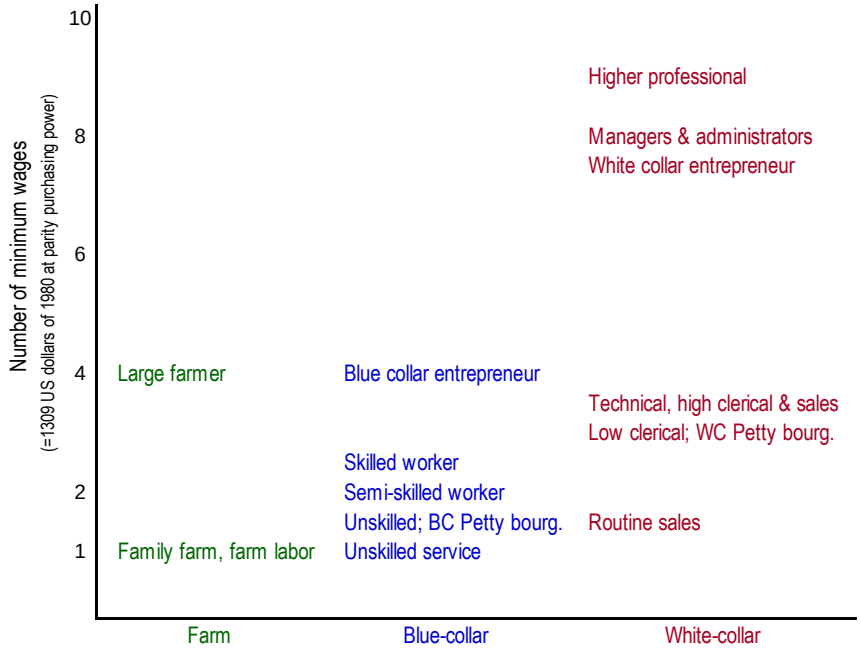
Large farmers in 1973 earned 4.1 minimum wages on average, four times as much as family farmers. By 1988 that had increased dramatically to 11.4 minimum wages, a gain of 7% a year, among the greatest for any occupational group.

Blue collar workers: In 1973, unskilled service workers earned no more than family farmers, while unskilled industrial workers earned a little more, 1.3 minimum wages. Over the next decade and a half both group's income grew by 1% or 2% a year – a worthwhile gain, although proportionately less than most other groups'. The numerous semi-skilled workers earned much more to begin with, 1.8 minimum incomes, increasing by around 2% a year. The blue-collar, petty bourgeoisie (self-employed without employees) fared similarly in that they were fractionally less prosperous than semi-skilled workers in 1973 and surpassed them by 1988.

Skilled workers earned 2.6 minimum wages in 1973, twice as much as unskilled industrial workers, but their incomes grew rather more slowly – indeed among the slowest of any occupational group.

In contrast, blue-collar entrepreneurs earned more than any other working class group in 1973, almost 4 minimum wages, and their income grew faster, 7% a year. This is the fastest growth of any occupational group, rivaled only by large farmers.

Figure 2. Income of different occupations, Brazil 1973 (occupational groups are defined in the text).



Source: Table 1, columns 9 and 10.

White-collar workers: Routine sales workers in 1973, the poorest white-collar group, earned just 1.7 minimum wages, less than many blue-collar workers. Over the next decade and a half that grew by 2% a year, a worthwhile if unremarkable gain. White-collar petty bourgeoisie – mostly market vendors and the like and routine clerical workers – did better. Technical, higher clerical and higher sales workers earned a bit more, about 3.5 minimum wages in 1973, and grew a little faster, 3% or 4% a year. White-collar entrepreneurs earned much more, 8 minimum wages, as did managers and administrators; both grew by a substantial 3% or 4% a year. Higher professionals, the best paid group, earned about 9 minimum wages in 1973 – so one lawyer or engineer typically earned as much as 9 farmers.[14] Their incomes grew by 3% or 4% a year thereafter, as much as other white-collar groups and more than most blue collar ones.

[14] This is why labor force participation among professional women is so high (Evans and Saraiva 1993).

Changes in poverty, 1973-1988

Economic development and other changes greatly reduced poverty in Brazil between 1973 and 1988, from 30% to 13%, a reduction in the number of poor people of 5% to 6% a year (table 1, columns 12 to 14). This confirms earlier research (Haller et al. 1982).

The gain for family farmers, by far the largest as well as poorest group of Brazilians, was only two-thirds that, but still a noticeable success: 65% were poor in 1973 and only 38% remained poor 15 years later. Among large farmers, 22% were living in poverty in 1973, mostly in the poor Northeast. By 1988 that declined sharply to only 6%, a dramatic drop of 8% to 9% a year.

Poverty also declined among blue-collar workers. For unskilled industrial workers it dropped from 22% to 15% (a decline of around 3% a year) and even more, from 26% to 11%, among the blue-collar petty bourgeoisie (6% a year). There were also declines among poorly paid white-collar workers, notably from 24% poor to only 7% poor among the white-collar petty bourgeoisie (8% a year). Poverty also declined sharply among routine sales workers. Among other groups of white-collar workers there was hardly any poverty to begin with.

Changes in wealth, 1973-1988

While poverty declined, the number of wealthy increased (table 1, columns 15 to 17). In 1973 they were 5% of the population, rising to 12% in 1988, an increase in the number of rich people of 5% to 6% a year.

The gain for large farmers (8% per year) was striking, few of whom had been wealthy in 1973. The gain was also dramatic for blue-collar entrepreneurs. Only 6% of them were wealthy in 1973, increasing to 41% a decade and a half later (growing fully 14% a year). The upper range of white-collar occupations also did very well. Among white-collar entrepreneurs, the proportion of wealthy almost doubled from 26% to 50% (or 4% to 5% a year). It rose around 3% a year among managers and administrators, leaving a clear majority wealthy by 1988, and among higher professionals, three-quarters of whom were wealthy by then.

Analysis: Effects net of compositional changes

Educational growth and other compositional shifts

This simple comparison of 1973 and 1988 is confounded by other concurrent changes. As we have seen, educational standards were rising, so by 1988 workers in most occupations had more schooling than their predecessors had in 1973, and higher incomes because of that. They often came from higher status families than their predecessors as well, and had higher incomes for that reason too (in Brazil and many developing nations, family background has a direct effect on income net of education and occupation). Moreover, more lived in cities and in the Southern regions of Brazil, where wages are higher. There were also modest differences in the proportion married and in labor force experience, both of which increase earnings.

Methods: These differences confound the comparison between 1973 and 1988, so we adjust for them by a regression based whole population standardization, adjusting for differences in family background, education, labor force experience, marital status, urban residence, region of birth, and gender. The standardization is based on twelve separate regression equations: one for farm men, one for blue-collar men, one for white-collar men, and another three for women, all estimated on 1973 data; then another six for 1988. This caters for all potential interactions between time, broad

occupational group, and gender. We use extensive sets of dummy variables for education, occupation, and father's occupation, eschewing assumptions of linearity. We believe that these flexible and detailed models, combined with the splendid PNAD data, provide strong evidence on the effects of development in Brazil in this period. Details are in the methods section.

Farmers: After adjusting for these differences, family farmers and farm laborers gained something less than 1% per year from economic development (0.7%; table 2, column 1), leaving them clearly

Table 2. Annual percent growth in income due to economic development *per se* and growth due to changes over time in family background, education, and all other causes.[1] Growth from economic development one percentage point higher than the national average is highlighted in green; one percentage point lower is highlighted in orange. Brazil, 1973-1988; N=89,8111 and 84,389.

	Develop-ment *per se*	All other causes	Development *per se*	
	All	All	Men	Women
Respondent's occupation	[1]	[2]	[3]	[4]
Farm:				
1 Farm laborer, family farmer	0.7	1.8	0.7	0.8
2 Large farmer	3.9	3.3	3.8	6.2
Blue collar:				
3 Unskilled service	1.2	-0.1	0.6	1.8
4 Unskilled industrial workers	0.8	1.0	0.8	0.4
5 Blue collar petty bourgeoisie	1.4	1.5	1.4	1.4
6 Semi-skilled workers	0.9	1.3	0.9	0.9
7 Skilled workers	0.3	0.9	0.2	1.9
8 Blue collar entrepreneur	2.9	4.4	2.8	5.0
White collar:				
9 Routine sales	0.4	1.9	0.5	-0.1
10 White collar petty bourgeoisie	1.8	2.4	1.8	2.2
11 Routine clerical	-0.5	0.1	-0.5	-0.5
12 Technical, high clerical & sales	1.1	2.4	0.7	1.6
13 White collar entrepreneur	1.3	1.8	1.3	0.8
14 Managers & administrators	1.5	2.3	1.6	0.7
15 Higher professional	2.4	1.1	2.5	1.9
Total:	1.3	2.2	1.3	1.2

[1] Income is expressed as multiples of the official minimum wage, which is the cost of a market basket of goods adequate to sustain an urban family of four, equal to $1309 per annum in US dollars of 1988 at parity purchasing power. Changes due to development are estimated by whole population standardization, applying the 1988 regression equations to the 1973 population. See methods section for details. Change due to all other causes is the total change (from Table 1) minus that due to development.

better off than they were just 15 years before. Proportionately, this was more than skilled workers gained and about as much as gained by unskilled industrial workers, the core of the working class. We attribute these adjusted gains to economic development and conclude that, in Brazil, economic development in the 1973-1988 style clearly benefited the poorest of the poor.[18]

For large farmers (row 2), the gain was even greater, perhaps 3% or 4% a year. Changes in the underlying occupational classification in the two surveys make for some uncertainty, with a bias toward over-estimating large farmers' gains. But there can be no doubt that they did very well indeed out of industrialization, at least as well as any other occupational group.[19]

Blue-collar workers: All groups of blue-collar workers gained from economic development after adjusting for compositional changes over time, some a bit more than others. Skilled manual workers, already prosperous, earned only 0.3% more, the smallest gain of any blue-collar group. Semi-skilled workers, the most numerous blue-collar group, gained just under 1% a year. Unskilled workers did not do quite so well. The blue-collar petty bourgeoisie – solo self-employed workers who make up a large, impecunious segment of the secondary economy – also prospered, gaining more than their employed peers, 1.4% per year. Blue-collar entrepreneurs – mainly small businessmen working in their own firms beside their employees – did best, gaining 2.9% per year.

White-collar workers: Economic development also benefited most white-collar employees, but some more than others. Routine clerical workers, previously unusually well paid, actually lost half of one percent a year – the only occupational group to lose out. Routine sales workers, poorly paid to begin with, gained just half a percent per year, about the same as unskilled blue-collar workers.

Technical, higher clerical, and higher sales employees did a bit better, gaining just over 1%. Both administrators and white-collar entrepreneurs, very well paid to begin with, gained even more.

Finally higher professionals, the best paid white-collar group, gained the most, 2.4% per year. Only blue-collar entrepreneurs and perhaps large farmers benefited more from economic development. It is tempting to speculate that Brazil's growth in technology and capital investment increased the demand for highly trained workers faster than schools and universities increased the supply – that technology won the "race between education and technology" (Jacobs 2004; Tinbergen 1975). The returns to skill would therefore go up.

Did the well-paid gain more?

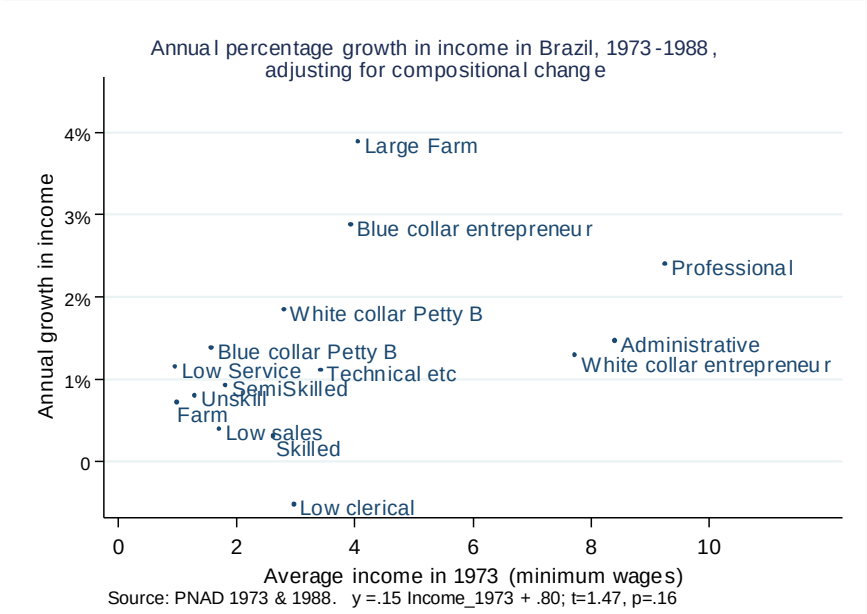
Overall, all occupational groups gained from Brazil's economic development, generally around 1% to 1.5% per year (figure 2). Only routine clerical workers were an exception, losing ground slightly. There is just a suggestion that occupations that were more prosperous than average in 1973 also gained more. But there are many exceptions (e.g. administrators and white-collar entrepreneurs). In

[18] The government's agricultural policy in this period was complex and often conflicting, but on balance supportive, with substantial investment in infrastructure and agricultural research (Baer 2001). Many of the benefits went especially to large farmers.

[19] In the 1960s, with American support, several of Brazil's agricultural universities began implementing modern scientific research on farming. In the 1970s, Brazil began sending large numbers of well selected students to take PhDs at the best American agricultural research universities. With their help in the new centralized research and extension organizations (Embrapa and Embrater) great strides were made in applying modern techniques, including ways of utilizing immense lands formerly hostile to farming. This, plus improved overseas marketing, resulted in a continuing surge of exports, making Brazil one of the world's leaders in export agriculture.

all, there is no statistically significant trend one way or the other (y = .15*Income in 1973; t=1.47, n.s.).

Figure 3. After adjustment for compositional changes, almost all occupational groups gained from Brazil's economic development. There is just a slight suggestion, not statistically significant, that occupations which were more prosperous in 1973 gained fractionally more (only 0.15 of one percent more).



Effect of compositional changes

Increases in income came about both because of economic development and also because of favorable shifts in occupational composition, more favorable family background, increases in education, greater urbanization, and other compositional changes between 1973 and 1988. These are summed up in table 2, column 2.

The exact compositional gains vary a good deal from occupation to occupation. In all, almost two-thirds of the improvement between 1973 and 1988 was due to these compositional changes, 2.2% out of the total of 3.5%. The largest gains are by blue collar entrepreneurs, followed by large farmers, and then the white-collar petty bourgeoisie.

Gender

Economic growth benefited women as much as men (table 2, columns 3 and 4). In Brazil, as elsewhere in the world (World Bank 2006: Ch.2), women earn less than men. But economic development did not increase the gap in percentage terms. Farm women did well, perhaps a bit better than their male counterparts. Unskilled service workers, by far the largest and poorest group of blue-collar women, gained an unusually large 1.8% a year[21] – much more than their male peers. The same is true of women who were skilled workers. The few women who were blue-collar entrepreneurs did

[21] Possibly as a result of a legal change requiring that household workers be paid regular wages.

splendidly, far better than their male counterparts. White-collar women had mixed experiences, mostly gaining a little less than their male peers.

In all, industrialization was of the greatest benefit to blue-collar women and to professionals, blue-collar employers, and large farmers of both sexes. It is striking that blue-collar women gained proportionately more than blue-collar men.

Wealth and poverty

As we have seen, economic development and other changes greatly reduced poverty in Brazil between 1973 and 1988 by about 5% to 6% a year. This decline in poverty came about both because of economic development and also because of increases in education, urbanization, and other compositional changes between 1973 and 1988. About half the decline was due to development *per se* and half to education and compositional changes (results not shown), which is similar to the pattern we have already seen for the growth in average income.

The increase in the number of wealthy, as with the decline in poverty, came about both because of economic development and also because of increases in education, urbanization, and other compositional changes. Roughly half the 5% to 6% gain was due to development *per se* and half to other changes (results not shown).

Conclusion

Does economic growth benefit ordinary people, or do the benefits flow mainly, or even entirely, to already prosperous elites? This simple question is perhaps the single most debated topic in economic history, a key to understanding the enduring class and political conflicts spawned by the industrial revolution, and a central issue in development policy in general (Kuznets 1966; OECD 2011; World Bank 2006; Heyns 2005) and for Latin America in particular (Bills, Haller et al. 1985; Kelley and Evans 2009; Kelley and Klein 1982). We have brought excellent new data to bear on this question from one important country, Brazil between 1973 and 1988.

In all, development seems to have benefited all segments of the Brazilian labor force. Some gained more than others, but there was no obvious statistically significant pattern. There was no obvious distinction between core and peripheral occupations. Moreover development raises women's pay in roughly equal proportion to men's.

Thus the Brazilian experience is broadly consistent with the neoclassical thesis about economic growth. It is not consistent with the widely held view that the early stages of economic growth impoverish the working class, either absolutely or relative to other classes; not consistent with Malthus; not consistent with the economic pessimists and the political pessimists; and not consistent with most dualist arguments.[22]

Proportional gains versus absolute gains

Throughout we have dealt mainly with proportional gains. However, our finding that the income of all groups grew at about the same *proportionate* rate also implies that the *absolute* gap between top and bottom grew, since in absolute terms 1% of a small income is less than 1% of a large income. For

[22] There is however a specifically Brazilian dualism in the split between those who have legal job security and those who do not: those in the protected sector have a 'carteira' documenting their entitlement to various job-related rights and benefits while those in the unprotected sector have no such protection (Pastore and Haller 1982). Those in the protected sector had an hourly income advantage of 20% to 30% in the industrial South and 32 % to 51 % in the pre-industrial Northeast (Haller and 1992).

example, 1% growth for a farm laborer will increase his income by only 1/10th of a minimum wage, while 1% growth for a higher professional will increase his by 9/10^{ths} of a minimum wage.[23] So the gap in purchasing power grows, even though the ratio of professionals' income to laborers' income remains the same.

This usage is strongly enjoined by the economic development literature. For example, the Gini coefficient and all the other widely used measures of inequality are unchanged if the income of everyone grows by 1% (this is 'scale invariance' e.g. Firebaugh 1999). This is despite the fact that the absolute gap between the top and bottom grows.[24]

Implications

If the Brazilian experience can be generalized to other instances of neoliberal development in the modern word, the policy implications are important. There may be losers from development. Peasants, traditional craftsmen, and small traders, for example, may be unable to meet competition from modern agriculture, factories, and supermarkets. But the losses are clearly overshadowed by the gains. In this our results clearly support the optimists about economic development rather than the numerous pessimists.

The *neo-classical economic hypothesis* claimed that in the long run in a free market, all – capitalist and worker, skilled and unskilled, farm and non-farm, will gain from economic development in roughly equal proportion. This hypothesis fits the facts reasonably well. Nonetheless, there is some unexplained variation with large farmers, blue-collar entrepreneurs, and higher professionals doing better than most and routine clerical workers worse. But there is no obvious, statistically significant pattern in these differences.

The Brazilian experience is inconsistent with dependency theory; inconsistent with Malthus; and inconsistent the economic and political pessimists. None of these gloomy predictions is warranted. Development in Brazil certainly did not further impoverish the poor or the excluded. On the contrary, they gained substantially. The Brazilian experience is also inconsistent with most dualist arguments. The benefits went to all, not just to a small, modern sector of the economy, not just to elites, and not just to men.

While the growth of income in the course of economic development in Brazil was impressive, it was not all caused by economic change. On the contrary, educational standards were rising, so by 1988 workers in most occupations had more schooling than their predecessors had in 1973, and they often came from higher status families than their predecessors. In addition, more lived in cities and in the prosperous Southern regions of Brazil, more were married, and labor force experience was rising. All of these increased earnings. Our analysis implies that around two-thirds of the gain is due to these compositional changes, education prominent among them. Thus most conventional econometric analyses of development's effects are over-optimistic since few control for compositional changes. Much of the credit must go to school teachers rather than to industrialists.

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[23] Farm laborers earned 1 minimum wage in 1973 and higher professionals 9.2 minimum wages.

[24] Income inequality as conventionally measured by the Gini may have grown in this period as well. But that reflects two quite different things: changes in the gap between groups (which are few, varied, and the topic of this paper) and changes in the distribution of people (which are many and large). The distributional changes, particularly the sharp decline in the farm sector, may actually *increase* the Gini as Kuznets famously pointed out (Nielsen and Alderson 1995). In the face of distributional changes like this, the Gini coefficient is ambiguous and not always a good guide to policy.

In sum, the Brazilian experience suggests that development brings benefits to all. Of course the initially well-off gain more in absolute terms, because 1% of a large sum is more than 1% of a small sum. Yet in the perspective of generations, this drama of change and development is an optimistic tale that brought Brazilians of all walks of life to a previously unknown level of prosperity.

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