**Appendix 1. Sources and data**

**Social tables (1850–1950)**

* **Active population:**

Information on the active population structure (by profession) comes from the 1872, 1920, 1940, and 1950 population censuses.

For each profession, the 1872 census includes information on gender (male or female) and labour condition (slave or free). In Brazil, the end of slavery came with the 'Lei Áurea' in 1888; nevertheless, there are good grounds to believe that the status and mean incomes of former slaves did not change directly.[[1]](#footnote-1) Therefore, the 1872 census (including slave records) is applied for years between 1850 and 1898. It should be noted that, since available disaggregated income data (by profession) for this period is for Rio de Janeiro and other regions of south-eastern Brazil, the sample of active population for this period was restricted to people in this area. (Espírito Santo, Minas Gerais, Municipio Neutro, Rio de Janeiro and São Paulo). It is also worth noting, however, that, by 1872, almost 75 per cent of total GDP was concentrated in these regions; further, this percentage increased during the first decades of the 20th century (Bértola *et al*., 2007, p. 3). Final aggregation resulted in an active population of 4 million individuals, distributed across 36 different professional categories.

The census of 1920 (used for the period 1899–1930) does not provide aggregate data at the country level, but, rather, disaggregated information by municipalities (a total of 1,304 in the country). A restricted sample with the most populated municipalities in the south-eastern region (183 of 430) was selected as follows: Minas Gerais (68 of 178); São Paulo (37 of 48); and Rio de Janeiro (78 of 204). The related data aggregation resulted in a sample of an active population of 7.8 million individuals distributed across 36 different professions (also distinguishing by gender).[[2]](#footnote-2) As for 1872, there are reasonable grounds to believe that the sample is representative of Brazil as a whole, as in 1920, more than half of the urban population of the country lived in Rio de Janeiro or São Paulo (Bethell 1989, p. 234).[[3]](#footnote-3)

 In 1940 and 1950, population censuses do not provide information at a disaggregated level (at either state or municipal levels) so, for these two benchmark years, the active population structure (and associated average incomes) refers to people in the whole country. The sample comprises an active population of 15.7 million (in 1940) and 25.8 million (in 1950), distributed across 22 professional categories.[[4]](#footnote-4) This means that they include 14 fewer professions than the censuses of 1872 and 1920. However, since this change seems to be the result of the aggregation of some professions into larger sectors, these censuses are still likely to include a majority of the active population. Likewise, as with the previous periods, there is evidence that economic activity at this time was also concentrated in the south-east region. It is therefore not surprising that the majority of the employed population (especially in industry and services) appearing in the censuses belonged to that region.[[5]](#footnote-5)

* **Average incomes:**

Annual incomes by professional category were obtained from several sources, including Bértola *et al*. (2007), Lobo (1978), Monasterio (n.d.) industrial censuses (DGE, 1950, 1956) and *Estatísticas Históricas do Brasil* (IBGE 1990)*.* Tables A1.1 and A1.2 below summarise information on main occupations and associated incomes by source and period.

* **Differences by work status (urban vs rural)**

Based on Lobo (1978), who provides nominal urban wages, I have estimated the rural nominal salaries across 34 professional categories as well as the proportion of population (by profession) in rural and urban areas. For this purpose, I use the data from Klein (1995, p. 538, Table 7), Nunes (2003, p. 334, Table 13), and Monasterio (n.d.). These provide information on the income declared in the electoral rolls, including voters’ profession and their area of residence (distinguishing between urban and rural parishes) allowing for the estimation of differences between urban and rural wages (by profession) and the proportion of people (also by profession) residing in one area or another (see Table A1.3).[[6]](#footnote-6)

**Table A1.1.**

**Brazil 1850-1930 sources and data**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Profession (census)** | **Census 1872** | **Income sources 1850 - 1898** | **Census 1920** | **Income sources 1899-1930** |
| Artista (artist) | **x** | Bértola et al. (2007)\*, Lobo (1978)\*\* and Monasterio (2010) | **-** | Bértola et al. (2007)\*, Lobo (1978)\*\* and Monasterio (2010) |
| Advogado (lawyer) | **x** | **x** |
| Canteiros, calceteiros e mineiros (stone cutter, platelayer, miner) | **x** | **x** |
| Capitalistas e propietarios (landowner, proprietor) | **x** | **x** |
| Cirugões (doctor surgeon) | **x** | **x** |
| Costureiras (dressmaker) | **x** | **x** |
| Criados e jornaleros (house servant and journeyman) | **x** | **x** |
| Escravos (slave) | **x** | **-** |
| Juízes (judge) | **x** | **x** |
| Oficiais de justiça (judicial solicitor) | **x** | **x** |
| Operario en edificaçoes (construction worker) | **x** | **x** |
| Op. Em metáis (blacksmith) | **x** | **x** |
| Religiosa (nun) | **x** | **x** |
| Serviço doméstico (domestic servant) | **x** | **x** |
| Administraçao pública (government administrator) | **x** | Lobo (1978)\*\* | **x** | Lobo (1978)\*\* |
| Capelão (priest) | **x** | **x** |
| Comerciantes, guarda-livros e caixeiros (ratailer, book-keeper, cashier) | **x** | **x** |
| Enfermeiras (nurse) | **x** | **x** |
| Farmacêuticos (chemist) | **x** | **x** |
| Lavradores (farmer) | **x** | **x** |
| Médicos (doctor) | **x** | **x** |
| Op. em Madeiras (carpenter) | **x** | **x** |
| Professores (teacher) | **x** | **x** |
| Sacristão (sexton) | **x** | **x** |
| Criadores (stock-breeder) | **x** | Estimated as horticulturist’s wage in Lobo (1978) | **x** | Estimated as horticulturist’s wage in Lobo (1978) |
| Notarios e escrivães (notary) | **x** | Equal to lawyer’s  | **x** | Equal to lawyer’s  |
| Op. de alimentaçao (food and beverage processors) | **-** |  | **x** | Equal to press worker’s in Lobo (1978)\*\*\* |
| Op. de apparelhos de transporte (transport equipment operator) | **-** |  | **x** | Equal to machine worker’s wage in Lobo (1978)\*\*\* |
| Op. de calçado (shoemaker) | **x** | Estimated as 89% carpenter’s wage in Lobo (1978)\*\*\* | **-** |  |
| Op. de cerámica (potter) | **-** |  | **x** | Estimated as 87% carpenter’s wage in Lobo (1978)\*\*\* |
| Op. de chapéus (hat maker) | **x** | Estimated as 89% carpenter’s wage in Lobo (1978)\*\*\* | **-** |  |
| Op. de mobiliario (bench carpenter) | **-** |  | **x** | Equal to carpenter’s wage in Lobo (1978) |
| Op. de producçao e transmissao de forças fhisicas (stationary engine operator) | **-** |  | **x** | Equal to machine worker’s wage in Lobo (1978)\*\*\* |
| Op. de vestuários (dressmaker) | **x** | Estimated as 89% carpenter’s wage in Lobo (1978)\*\*\* | **x** | Estimated as 89% carpenter’s wage in Lobo (1978)\*\*\* |
| Op. em couros e peles (leather goods maker) | **x** | Estimated as 87% carpenter’s wage in Lobo (1978)\*\*\* | **x** | Estimated as 87% carpenter’s wage in Lobo (1978)\*\*\* |
| Op. em productos químicos (chemical products) | **-** |  | **x** | Equal to distiller’s wage in Lobo (1978) |
| Op. em tecidos (weaver) | **x** | Estimated as 60% carpenter’s wage in Lobo (1978)\*\*\* | **x** | Estimated as 60% carpenter’s wage in Lobo (1978)\*\*\* |
| Op. relat ás sciencias, lettras e artes (artists) | **-** |  | **x** | Equal to carpenter’s wage in Lobo (1978)\*\*\* |
| Parteiros (midwife) | **x** | Equal to nurse’s wage in Lobo (1978) | **x** | Equal to nurse’s wage in Lobo (1978) |
| Procuradores (procurator) | **x** | Equal to lawyer’s wage in Lobo (1978) | **x** | Equal to lawyer’s wage in Lobo (1978) |
| Sem profissão (without any profession) | **x** | Equal to domestic servants | **x** | Equal to domestic servants |

Notes: English translations of professions are based on HISCO database.

\* Bértola *et al*. 's (2007) estimations are mostly based on Lobo (1978).

\*\* Lobo’s (1978) estimations have been adjusted according to those reported by other authors for specific periods: Klein (1995) provides data for 1880; Nunes (2003) from 1870 to 1889; Monasterio (2010) for 1880 and 1881.

\*\*\* Equivalences (in %) are based on information on industrial wages between 1920–1928 (*Diretoria Geral de Estatística* 1928)

**Table A1.2**

**Brazil 1940, 1950: sources and data**

|  |  |  |  |
| --- | --- | --- | --- |
| **Profession (census)** | **Census 1940** | **Census 1950** | **Sources 1940 and 1950** |
| Agricultura (Farmers) | **x** | **x** | Agricultural censuses 1940, 1950 |
| Capitalistas e Propietários (Landowners, proprietors)\* | **x** | **x** |
| Criaçao (livestock farmer) | **x** | **x** |
| Capitalistas e Propietários (Owners, proprietors)\* | **x** | **x** | Industrial censuses 1940, 1950 |
| Extração de mat. Mineraes (Stone cutters, platelayers, miners) | **x** | **x** |
| Industria de transformaçao (processing industry workers) | **x** | **x** |
| Produçao e alimentos, bebidas etc (food and beverage processors) | **x** | **x** |
| Texteis, vestuario, calçados etc (weavers, dressmakers, shoe makers etc) | **x** | **x** |
| Metalurgia, material de transporte, etc (blacksmiths, toolmakers, machine-tool operators) | **x** | **x** |
| Química, derivados de petróleo (workers with chemical and related processes) | **x** | **x** |
| Outras industrias (bricklayers, stonemasons, potters) | **x** | **x** |
| Transportes e comunicaçoes (transports) | **x** | **x** | Transport censuses 1940 and 1950 |
| Alimentos, bebida, comércio (salesperson, wholesale or retail trade) | **x** | **x** | Commercial censuses 1940 and 1950 |
| Bancos e outras actividades financeiras (bank tellers, finance clerks, insurance salesman) | **x** | **x** |
| Comércio produtos agrícolas, químicos, maquinas (purchasing agents or technical salesman) | **x** | **x** |
| Outras actividades comerciais (other sales workers) | **x** | **x** |
| Capitalistas e propietarios (Owner, proprietor)\* | **x** | **x** | Services censuses 1940 and 1950  |
| Serviçio de recreaçao (leisure services) | **x** | **x** |
| Servicio doméstico (service servants) | **x** | **x** |
| Outros serviços pessoais (hotel and restaurants) | **x** | **x** |
| Actividades mal definidas (badly defined activities) \*\* | **x** | **x** |
| Serviçio governamentais (government administrators)\*\*\* | **x** | **x** | IBGE (1990) |

Notes: English translations of professions are based on HISCO database.

 \* Agricultural owner rents= land rents+ production value- cost of production / number of establishments of large scale production; Industrial owner rents (assuming one owner per establishment)= Annual rent per establishment (production value+ processing value - consumption- expenses- salaries)/ number of establishments; Services owner rents (assuming one proprietor per establishment) = Annual rent per establishment (revenues from commodity trade - expenses- salaries)/ number of establishments.

\*\*Average of wages on housing and care activities (Doorkeepers, hairdressers, beauticians) \*\*\*Government administrator’s wage= Government personnel expenditure / personnel. Source: IBGE/ *Conteúdo Histórico/ Estatísticas do século XX/ Econômicas/ Contas Nacionais/Setor Público/Despesa primaria do Governo / pessoal*.

**Table A1.3**

**Sources for rural and urban adjustments**

**Appendix 2. Complementary Figures and Tables**

Figure A2.1 shows the *Inequality Possibility Frontier* (on the left) and their associated *extraction ratios* (right figure), that is, the ratio between the actual inequality and the maximum feasible inequality. The area below the frontier embraces all possible inequality estimates compatible with overall survival.[[7]](#footnote-7) Here the maximum feasible inequality has been calculated considering a minimum subsistence level of $PPP 365 (i.e., $1 per day). I assume an intermediate subsistence minimum ($PPP 365) between a purely physiological minimum of $PPP 300 (Milanovic *et al*. 2010) and a subsistence minimum of $PPP 400 which covers more than physiological needs (Maddison 1998). This intermediate subsistence minimum of $PPP 365 per annum in 1990 international prices is consistent with the World Bank absolute poverty line $1.08 per day per capita in 1993 $PPP (Chen and Ravallion 2007).[[8]](#footnote-8)

**Figure A2.1**

**Brazil’s Inequality Possibility Frontier and Extraction Ratios (1900-1950)**

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**Table A2.1**

**Inequality-development relationship in Brazil: baseline and subsamples**

|  |  |  |
| --- | --- | --- |
|  | Baseline | Subsamples |
|  | 1850-2010 | 1889-1970 | 1900-1970 | 1900-1980 | 1960-2010 | 1970-2010 | 1980-2010 |
|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| GDP per capita | 0.021\*\*\* | 0.012\* | 0.022\* | 0.020\* | 0.010\*\*\* | 0.010\*\*\* | 0.015 |
|  | (0.001) | (0.007) | (0.012) | (0.010) | (0.001) | (0.002) | (0.009) |
| GDP per capita squared | -0.000\*\*\* | -0.000 | -0.000 | -0.000\*\*\* | -0.000\*\*\* | -0.000\*\*\* | -0.000\*\* |
|  | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Population density | 0.290 | 2.160\*\* | 0.276 | 1.620 | 0.139 | 0.143 | -0.007 |
|  | (0.207) | (1.022) | (2.915) | (1.799) | (0.166) | (0.166) | (0.212) |
| Constant | 9.308\*\*\* | 10.449\*\*\* | 7.821\* | 6.690\* | 35.450\*\*\* | 36.911\*\*\* | 23.614 |
|  | (0.772) | (3.490) | (4.039) | (3.340) | (2.554) | (6.036) | (24.567) |
|  |  |  |  |  |  |  |  |
| Observations | 100 | 46 | 35 | 41 | 36 | 35 | 29 |

Notes: For inequality data see text. GDP per capita data are from Maddison Project Database 2013. Population density was computed as population (in thousands) from Maddison Project Database 2013 divided by Brazil’s current area (in squared km). Missing years in the data are due to lack of Gini data. Robust standard errors are in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

1. There is evidence that, once the free labour system was established, 'darker skinned people tended disproportionately to work at manual [low paid] jobs' (Owensby 1999, p. 41). [↑](#footnote-ref-1)
2. Total population at the time was about 27 million people. [↑](#footnote-ref-2)
3. Moreover, by 1920, more than half of the urban population resided in Rio de Janeiro or São Paulo (Bethell 1989, p. 234). [↑](#footnote-ref-3)
4. According to the demographic censuses, total population in Brazil in 1940 and 1950 consisted of 41.2 million individuals and 51.9 million individuals respectively. [↑](#footnote-ref-4)
5. By 1940, 48 percent of Brazil’s total population lived in the south-east region, whose urban population represented 56 per cent of Brazil’s total urban population (IBGE 1990). [↑](#footnote-ref-5)
6. Klein (1995) and Nunes (2003) provide information for São Paulo, while Monasterio’s (n.d) register does so for Rio Grande do Sul.The estimations obtained for São Paulo and Rio Grande do Sul have been compared with those obtained for the city of Rio de Janeiro, provided by the DGE (1895). Results are very similar, so it seems possible to use the same estimations for residents throughout the south-eastern region. [↑](#footnote-ref-6)
7. It should be noted, however, that the estimation of the Inequality Possibility Frontier for the case of Brazil is problematic as slave wages might have been below subsistence levels while the population continued to grow due to the transatlantic slave trade and immigration. [↑](#footnote-ref-7)
8. For a further discussion of Brazil’s subsistence levels and associated inequality possibility frontiers see Milanovic *et al*., (2007, 2010) and Bértola *et al.* (2012). [↑](#footnote-ref-8)