

Extreme and Persistent Inequality: New Evidence for Brazil Combining National Accounts, Surveys and Fiscal Data, 2001-2015

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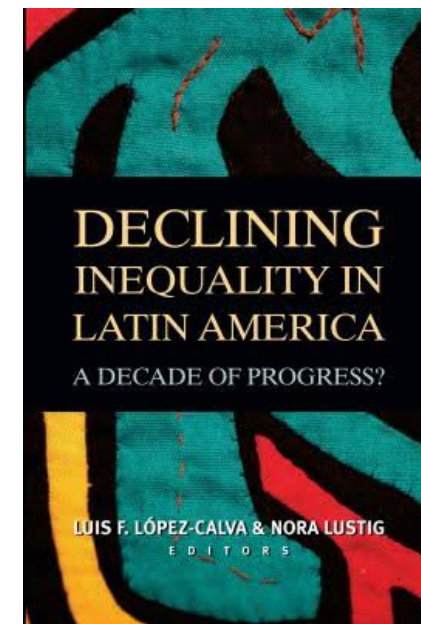
Why Brazil?

- A large developing country with a long and dramatic inequality history
- High market income inequality (Gini = 0.50-0.60)
- Improved data quality and access in recent years

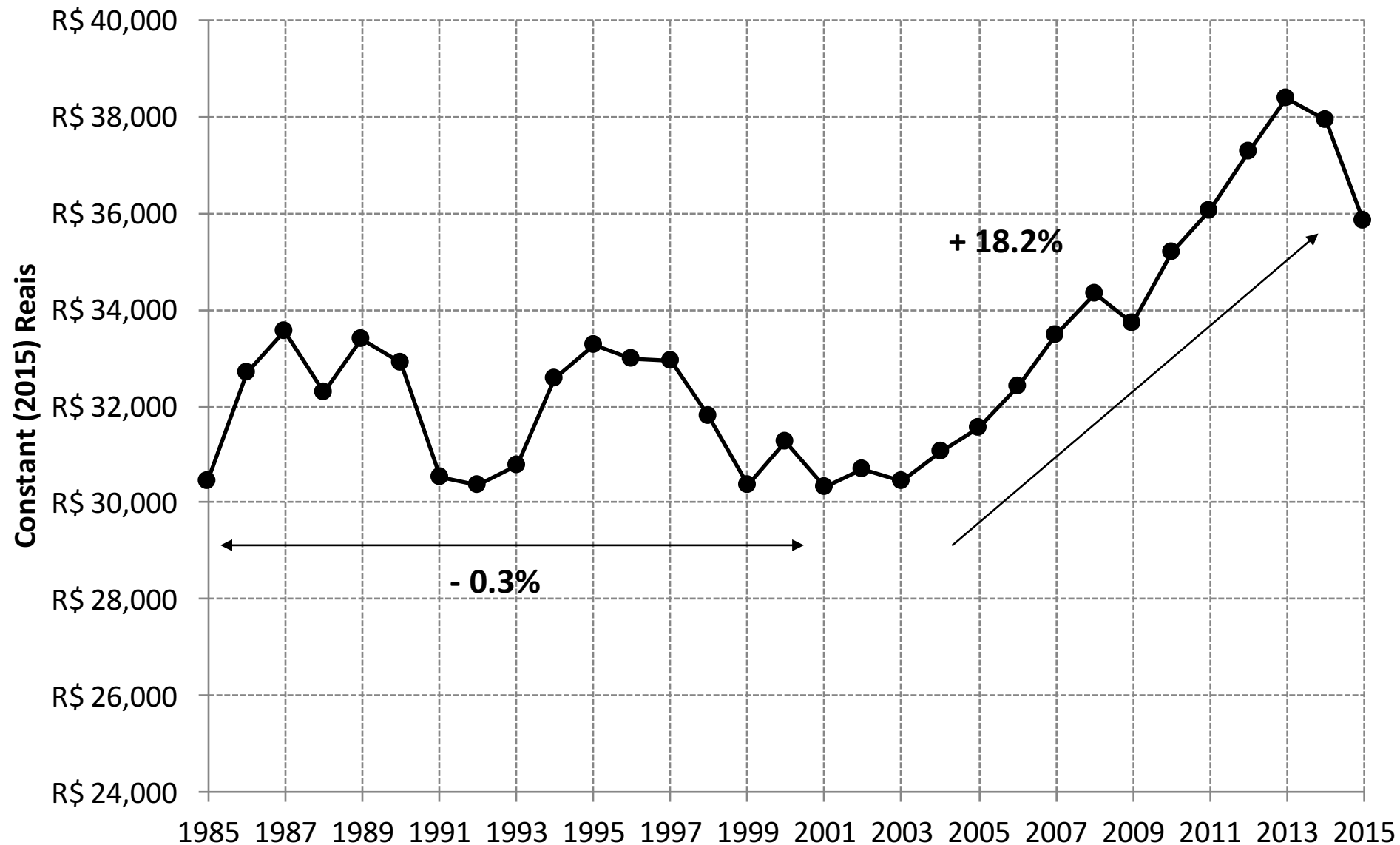
The 2000s

- Return of growth (18% per adult) amid crises
- First “PT” government since early 1960s
- Strong decline in income inequality during 2000s according to surveys
(‘success story’) : fall in Gini by 7-10 pp

Barros et al. (2010) in López-Calva and Lustig (Eds.) *Declining inequality in Latin America: A Decade of Progress?*



Evolution of per adult national income in Brazil: 1985-2015



Notes: The figure shows the evolution of national income per adult (aged 20+). IBGE and WID.world.

Distributional National Accounts (DINA)

= Adding inequality to SNA (using surveys and fiscal data)

Applied to Brazil to offer a new analysis of inequality:

- How unequal is Brazil?
- How has inequality evolved over this new period of growth and government?
- Is there evidence of a decline? Sources?
- How was growth distributed?

First attempt at combining three sources of data for Brazil

Data sources, Concepts and Method

- **Surveys: PNAD (IBGE)**
 - Micro-files: 2001-2015
 - Complemented with POF 2009 survey

- **Personal income tax declarations (DIRPF)**
 - Tabulations of total gross income (taxable, withheld & exempt) before social contrib.
 - Coverage: 25-28 million declarations (20% of adult population)
 - Tax unit = individuals or couple

- **National accounts (IBGE)**
 - Flow of funds (2001-2015) = SNA (2008)
 - Financial balance sheets (2010-2014)

Unit of observation: *Equal-split adults*

- Aged 20+, income of married couples is equally divided

Income concept: *Pre-tax post-replacement national income (DINA)*

- National income attributed to households
- Including pensions + unemployment insurance & deducting social contributions
- vs fiscal income = income assessed by tax administration
- vs survey income = income appearing in surveys

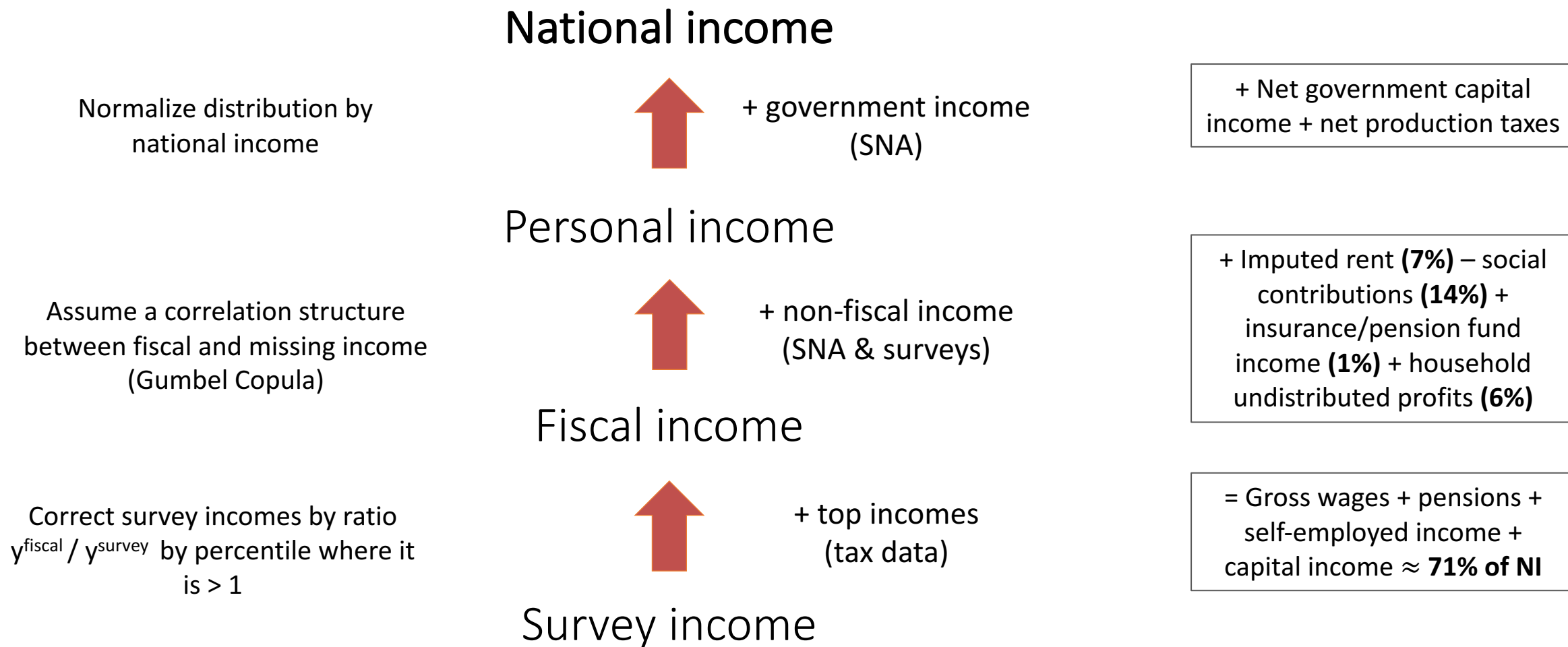
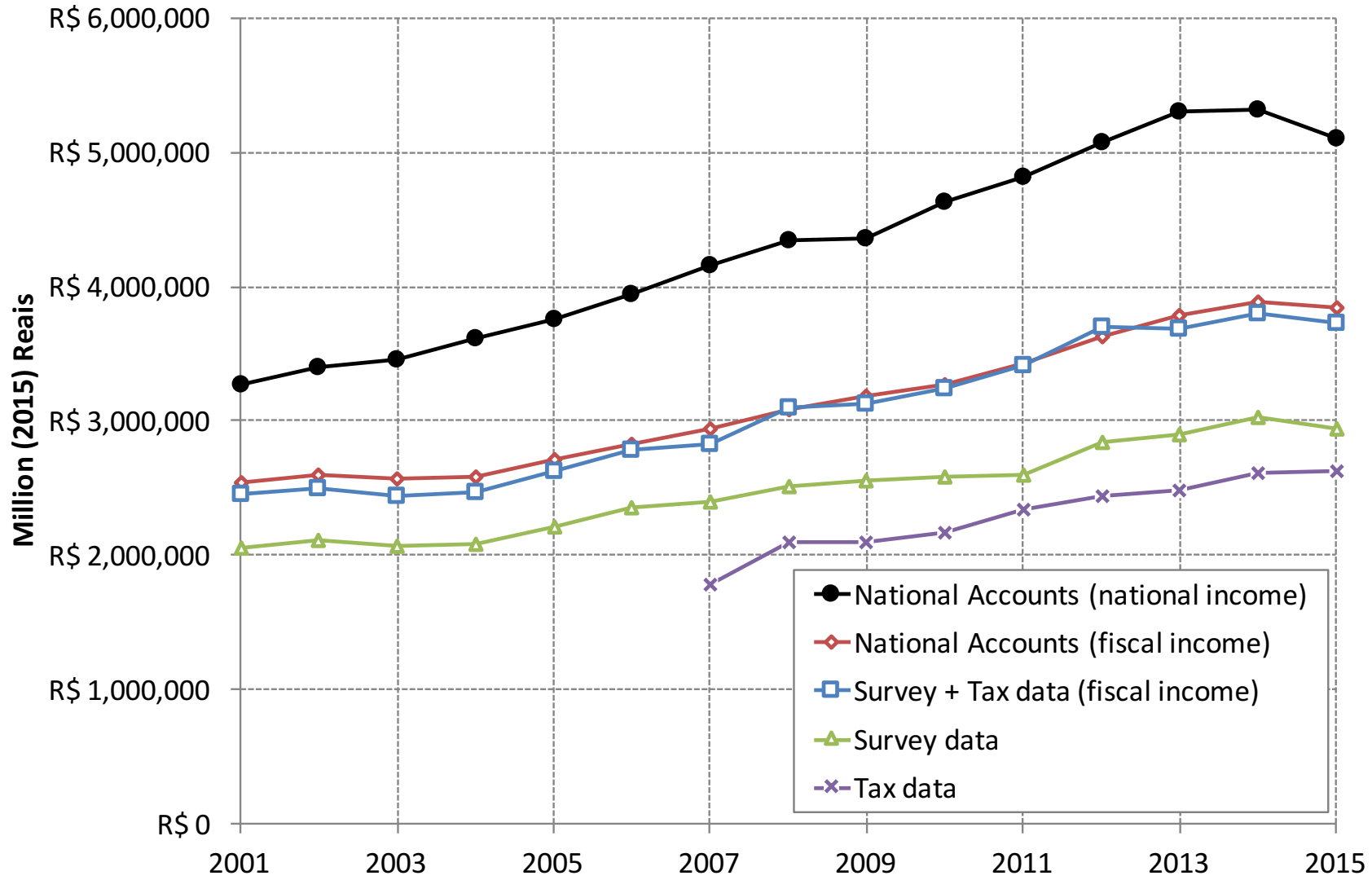


Figure 1. Evolution of total real income in Brazil: 2001-2015



Notes: The figure shows the evolution of total real income in billions of Reals across datasets and income concepts. The Survey + Tax data series uses survey incomes up to the percentile where average percentile income in the surveys is less than or equal

Combine surveys + tax data as above but for labour earnings

Note: *Labour income is not purely observable in tax returns*

Estimation:

- **Taxable income** (wages, self-employed labour income, rent)
- Distribution of taxable income – property rent (= 2% of fiscal taxable income in national accounts)
- Assumptions:
 - 20% of rental income → Middle 40% taxable income share
 - 80% of rental income → Top 10% (incl. 40% → Top 1%) share

Results: income inequality in Brazil 2001-2015

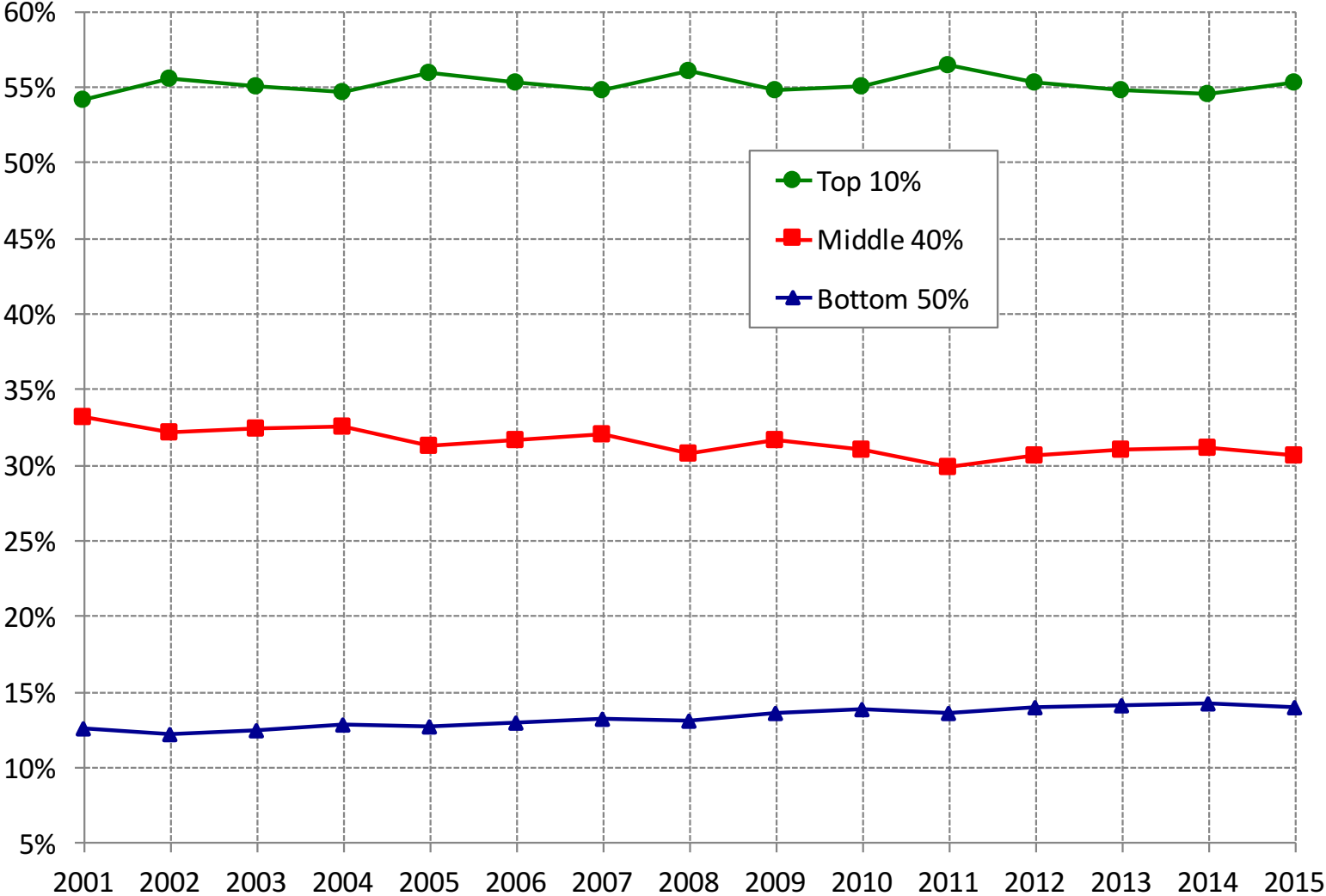
Extreme and consolidated concentration at the top vs compression in bottom 90%

Surveys seem to massively underestimate levels and overestimate decline

Overall the distribution narrowed over the period

Labour incomes seem to do most of the work

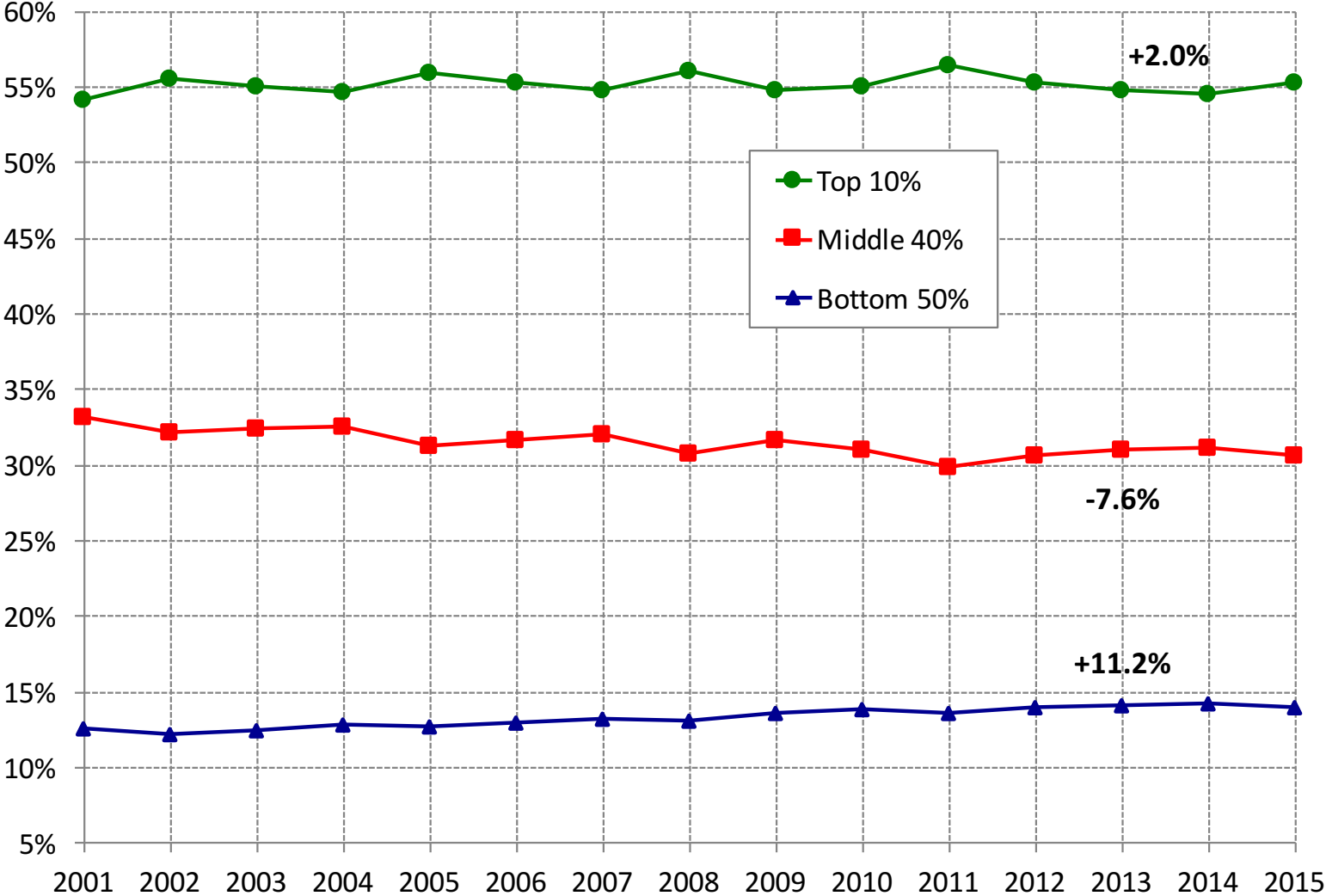
Figure 2. Income inequality in Brazil: DINA estimates



Notes: Distribution of pretax national income (before taxes and transfers, except pensions and unemployment insurance) among adults. Corrected estimates (combining survey, fiscal and national accounts data). Equal-split-adults series (income of married couples divided by two).



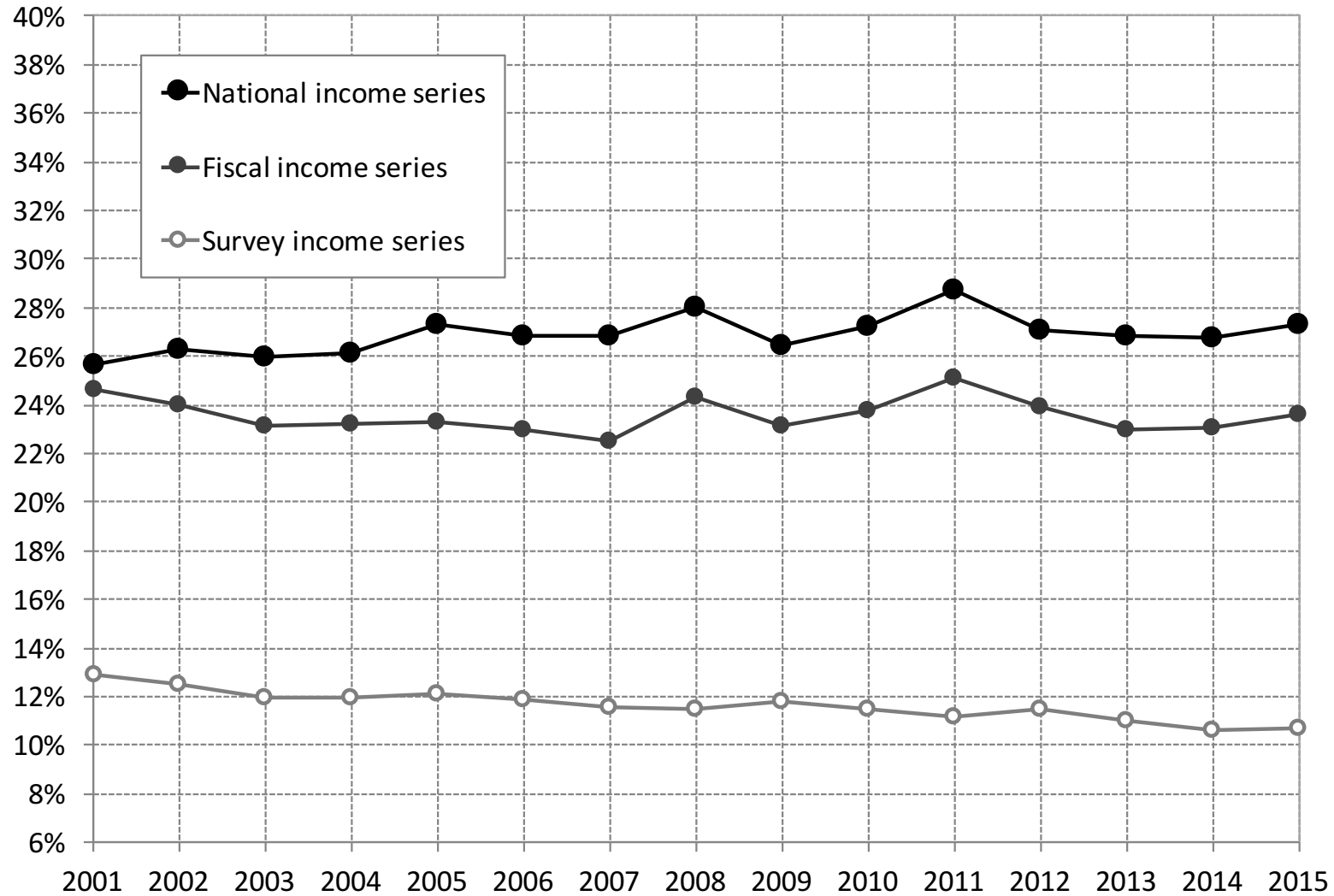
Figure 2. Income inequality in Brazil: DINA estimates



Notes: Distribution of pretax national income (before taxes and transfers, except pensions and unemployment insurance) among adults. Corrected estimates (combining survey, fiscal and national accounts data). Equal-split-adults series (income of married couples divided by two).



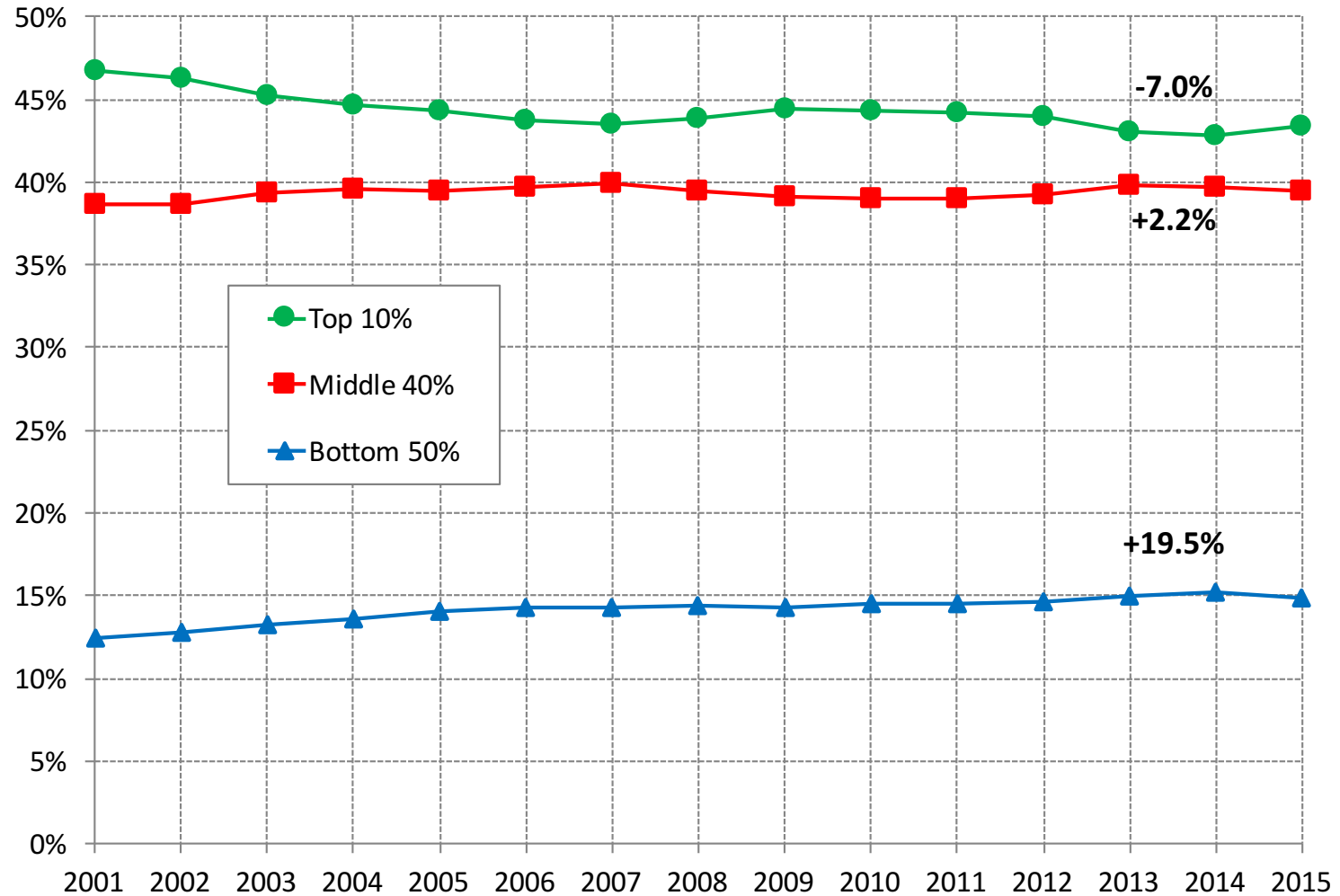
Figure 8. Top 1% in Brazil: survey vs fiscal vs DINA series



Notes: Distribution of income (before taxes and transfers, except pensions and unemployment insurance) among adults in our three series, raw estimates from surveys, a fiscal income series (combining surveys and fiscal data) and a national income series (combining national accounts, surveys and fiscal data). Equal-split-adults series (income of married couples divided by two).

Inequality of labour income more clearly falls

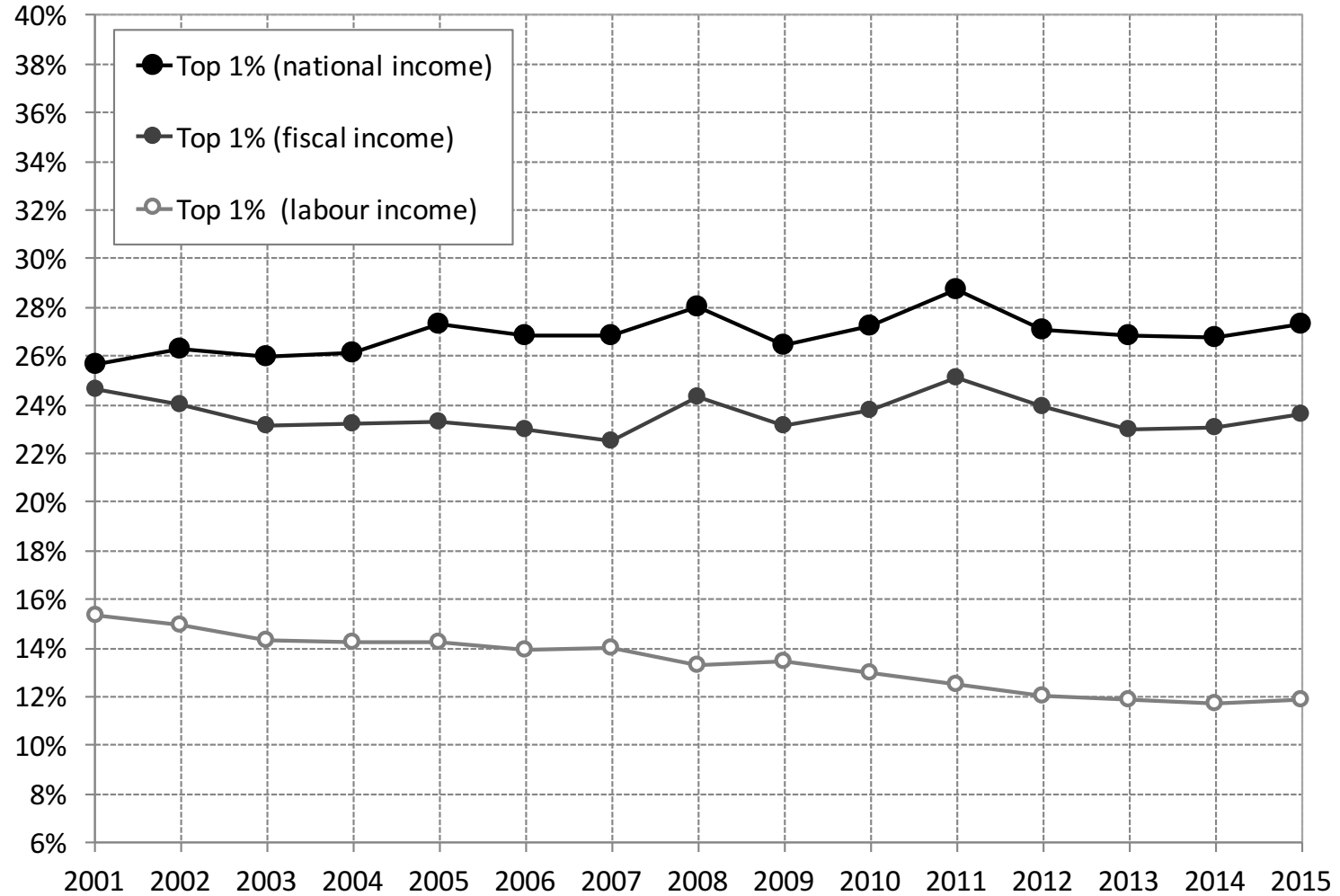
Figure 9. Labour income shares in Brazil: corrected estimates



Notes: Distribution of pretax taxable labour income (before taxes and transfers, except pensions and unemployment insurance) among adults. Corrected estimates (combining survey, fiscal and national accounts data). Equal-split-adults series (income of married couples divided by two).

Capital income makes up the difference

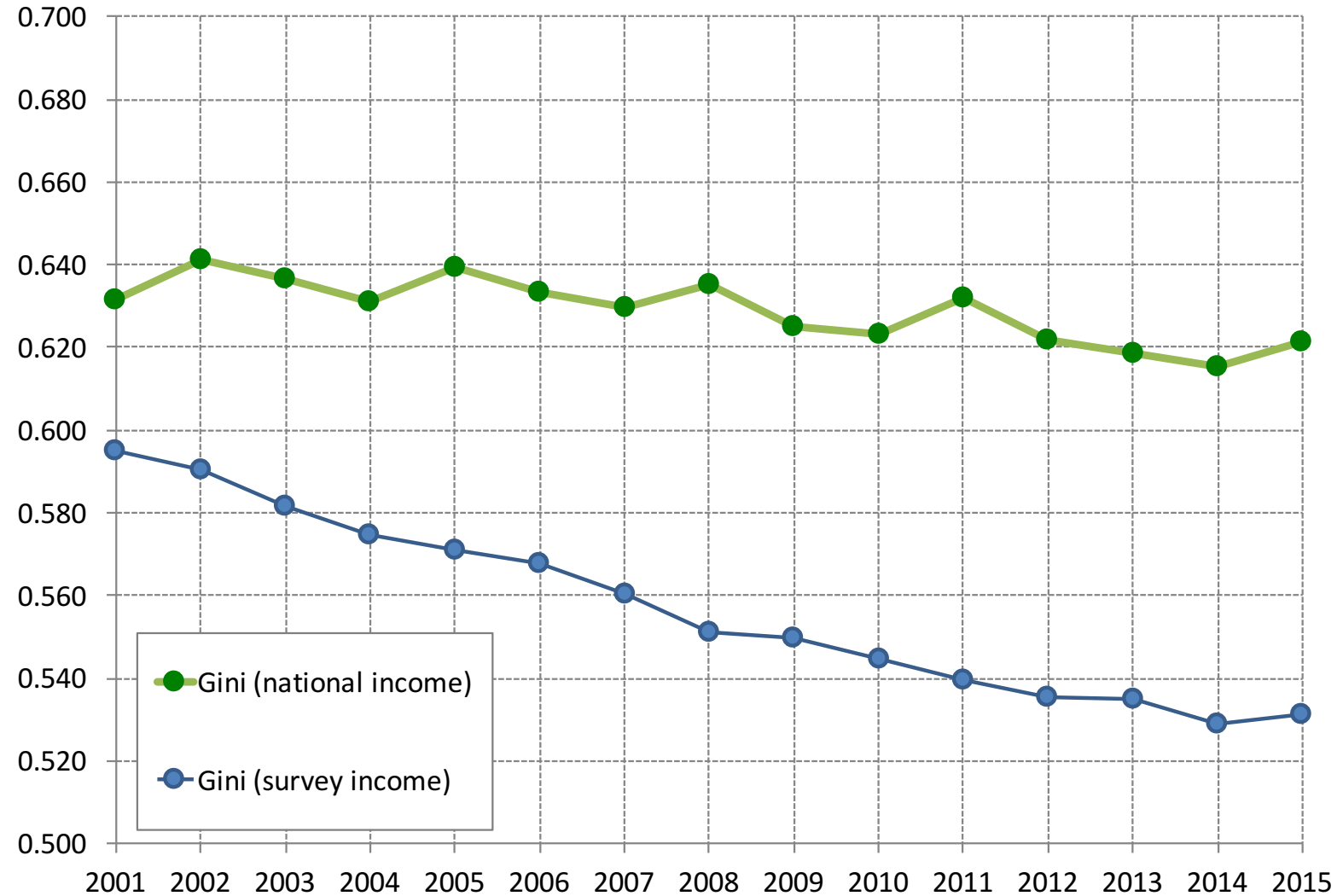
Figure 10. Top 1% in Brazil: labour income vs total income



Notes: Distribution of pre-tax income (before taxes and transfers, except pensions and unemployment insurance) among adults compared to a fiscal total income series (combining surveys and fiscal data) and a national income series (combining national accounts, surveys and fiscal data). Equal-split-adults series (income of married couples divided by two).

Role of labour income inequality for Gini

Figure A.4. Gini coefficients in Brazil: 2001-2015



Notes: Distribution of income (before taxes and transfers, except pensions and unemployment insurance) among adults. Raw estimates from surveys and a national income series (combining national accounts, surveys and fiscal data). Equal-split-adults series (income of married couples divided by two).

Most of the action from the labour income side

Minimum wage (+ 64% real growth since 2000)

- Incidence: Ferreira et al. (2017); Brito et al. (2016)

Fall in education premium

- Higher wage growth of lower skilled labour
- Exceptional educational expansion, 1990-2010 (Barro and Lee, 2013)

“Horizontal wage inequalities” (Ferreira et al. 2017)

- Men vs women; blacks vs whites; rural vs urban; formal vs informal sectors

Growth was far from being equally distributed

Income growth under actual sharing and equal sharing in Brazil

Income groups (distribution of per adult pre-tax national income)	Actual cumulated growth (2001-2015)	Actual fraction of total growth captured	Counterfactual growth rates (2001-2015)	Fraction of total growth captured (equal sharing)
Full population	18.2%	100%	18.2%	100%
Bottom 50%	31.4%	21.8%	72.1%	50%
Middle 40%	9.3%	16.9%	21.9%	40%
Top 10%	20.6%	61.3%	3.4%	10%
<i>incl. Top 1%</i>	<i>25.9%</i>	<i>36.5%</i>	<i>0.7%</i>	<i>1%</i>
<i>incl. Top 0.1%</i>	<i>21.3%</i>	<i>14.7%</i>	<i>0.1%</i>	<i>0.1%</i>
<i>incl. Top 0.01%</i>	<i>84.8%</i>	<i>22.3%</i>	<i>0.04%</i>	<i>0.01%</i>
<i>incl. Top 0.001%</i>	<i>121.5%</i>	<i>13.8%</i>	<i>0.01%</i>	<i>0.001%</i>

Notes: Distribution of pre-tax national income among equal-split adults. The unit is the adult individual (20-year-old and over; income of married couples is split into two). Fractiles are defined relative to the total number of adult individuals in the population. Corrected estimates (combining survey, fiscal and national accounts data).

International comparisons

Structure of inequality in Brazil: developed country elite vs developing country poor

Brazil: at the world inequality frontier?

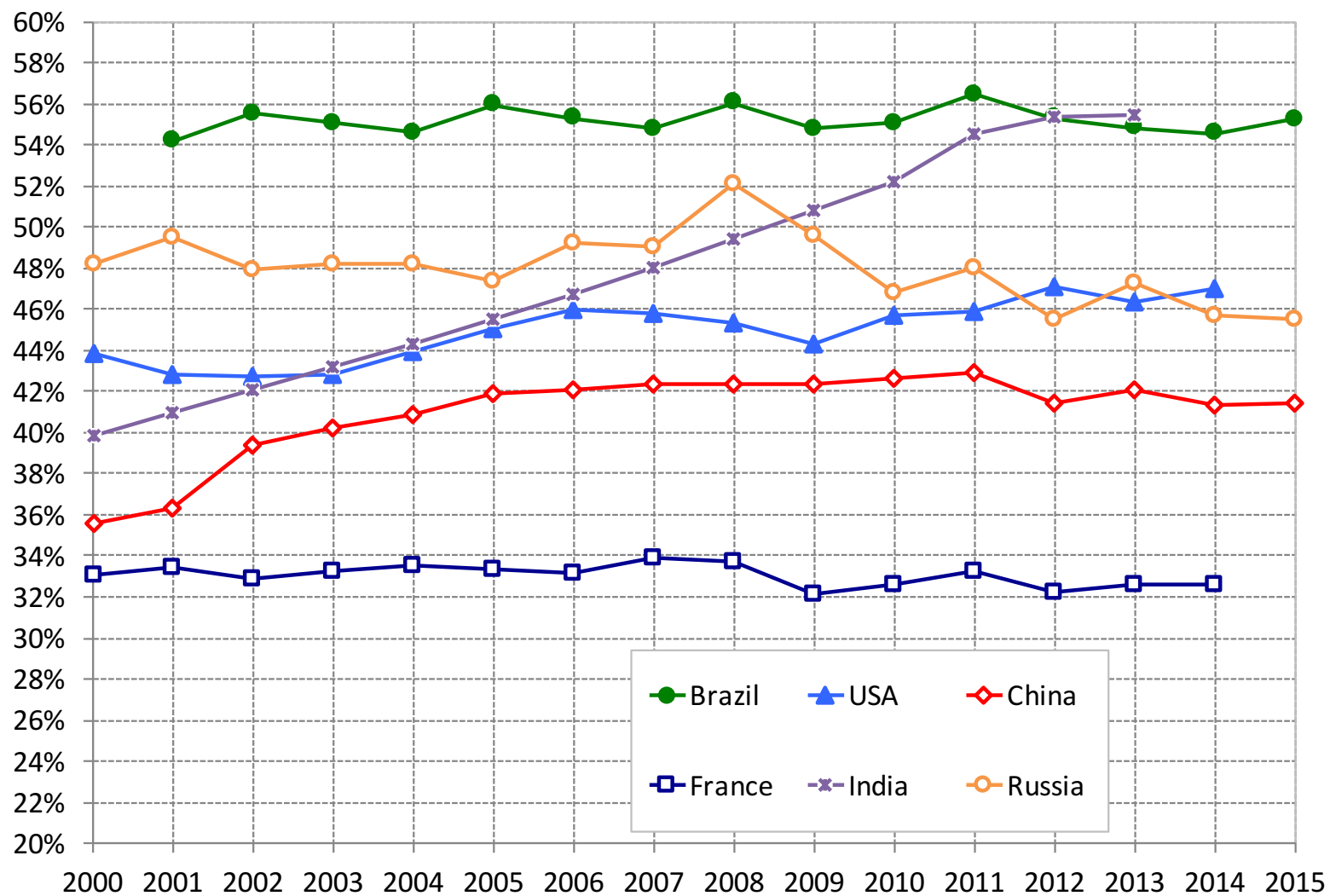
The structure of inequality in Brazil: a country of two societies

Table 2.1 Average incomes in Brazil, France and USA: 2014

Income groups (distribution of per adult pre-tax income)	Brazil (2014 Euros PPP)	France (2014 Euros PPP)	USA (2014 Euros PPP)
Full Population	€15,178	€32,688	€49,509
Bottom 50%	€4,337	€14,692	€12,422
Middle 40%	€11,830	€36,691	€50,054
Top 10%	€82,772	€106,660	€232,767
<i>incl. Top 1%</i>	<i>€405,698</i>	<i>€352,921</i>	<i>€1,000,041</i>
<i>incl. Top 0.1%</i>	<i>€1,857,471</i>	<i>€1,208,114</i>	<i>€4,614,051</i>
<i>incl. Top 0.01%</i>	<i>€8,520,530</i>	<i>€4,226,609</i>	<i>€21,550,391</i>
<i>incl. Top 0.001%</i>	<i>€40,147,935</i>	<i>€12,894,262</i>	<i>€94,063,272</i>

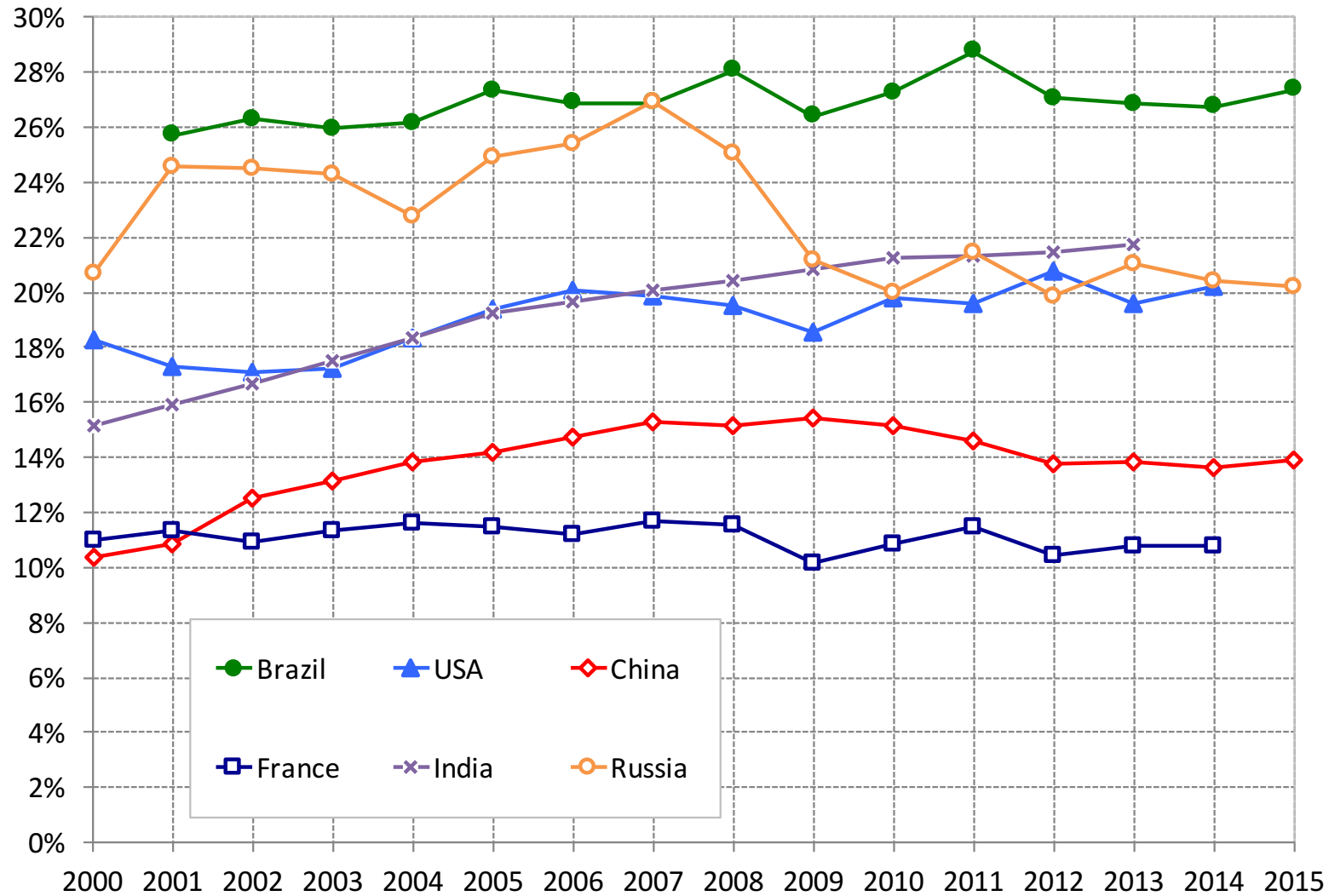
Notes: The unit is the adult individual (20-year-old and over; income of married couples is split into two). In 2014, 1 Euro = 2.32 reals (purchasing power parity). Income corresponds to pre-tax national income. Fractiles are defined relative to the total number of adult individuals in the population. Corrected estimates combine national accounts, surveys and fiscal data.

Figure 11. Top 10% income share: Brazil vs other countries



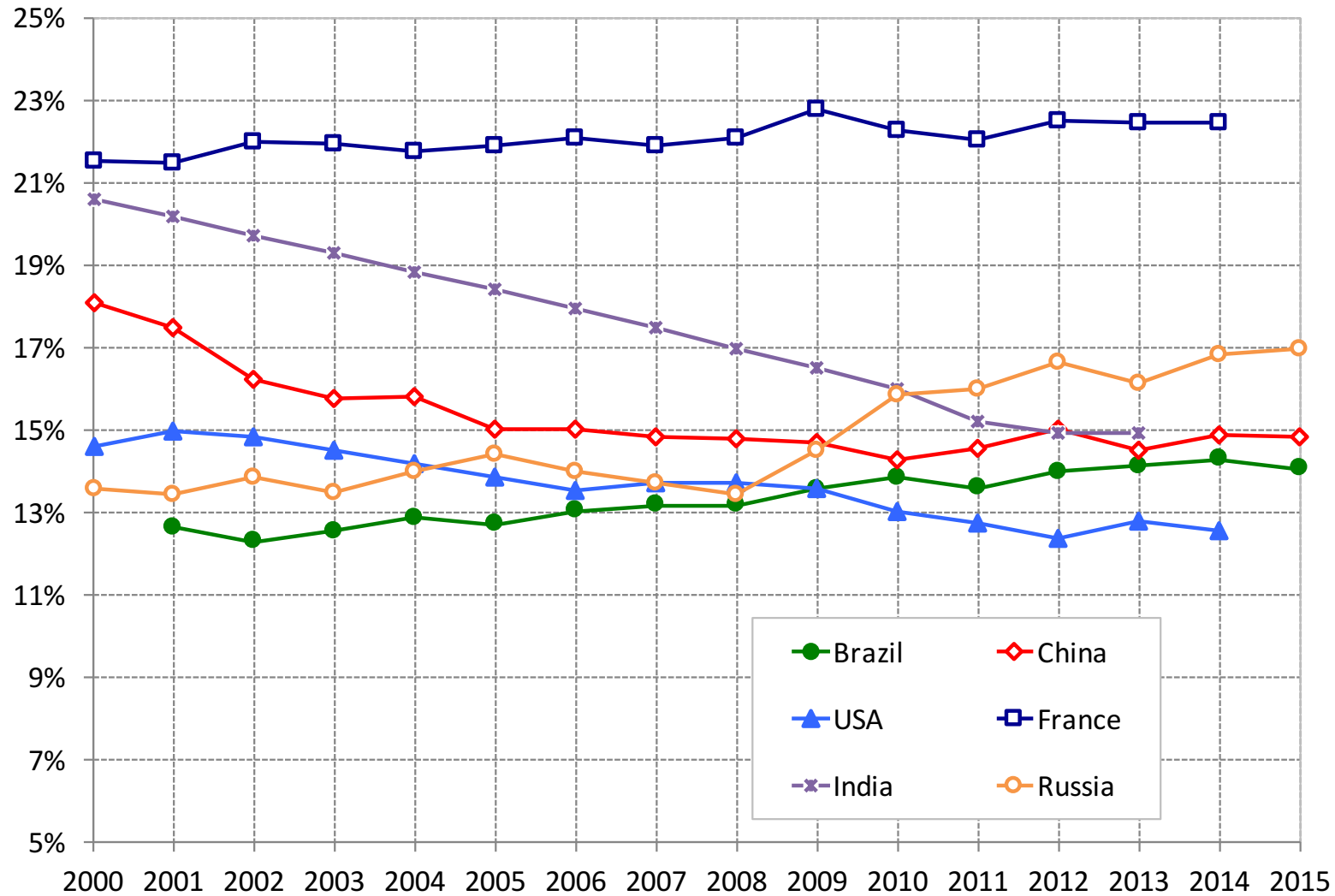
Notes: Distribution of pretax national income (before taxes and transfers, except pensions and unemployment insurance) among adults. Corrected estimates (combining national accounts, surveys and fiscal data). Equal-split-adults series (income of married couples divided by two). Estimates for USA, France and China, India and Russia are from <http://wid.world/>.

Figure 14. Top 1% income share: Brazil vs other countries



Notes: Distribution of pretax national income (before taxes and transfers, except pensions and unemployment insurance) among adults. Corrected estimates (combining national accounts, surveys and fiscal data). Equal-split-adults series (income of married couples divided by two). Estimates for USA, France and China, India and Russia are from <http://wid.world/>.

Figure 13. Bottom 50% income share: Brazil vs other countries



Notes: Distribution of pretax national income (before taxes and transfers, except pensions and unemployment insurance) among adults. Corrected estimates (combining national accounts, surveys and fiscal data). Equal-split-adults series (income of married couples divided by two). Estimates for USA, France and China, India and Russia are from <http://wid.world/>.

- The findings confirm Brazil's status as one of the world's most unequal countries using DINA framework
- Extreme and persistent concentration at the top: rich country elite, poor country non-elite. Cash poor bottom (but growing) and a *"squeezed middle"*
- Income inequality among Bottom 90% decreased with poverty reduction
 - Compression of labour incomes (min. wage, fall in education premium)
 - Lack of capital resources

N.B. Importance of capital income to explain resilience of top shares & inequality

Re-examine wage inequality

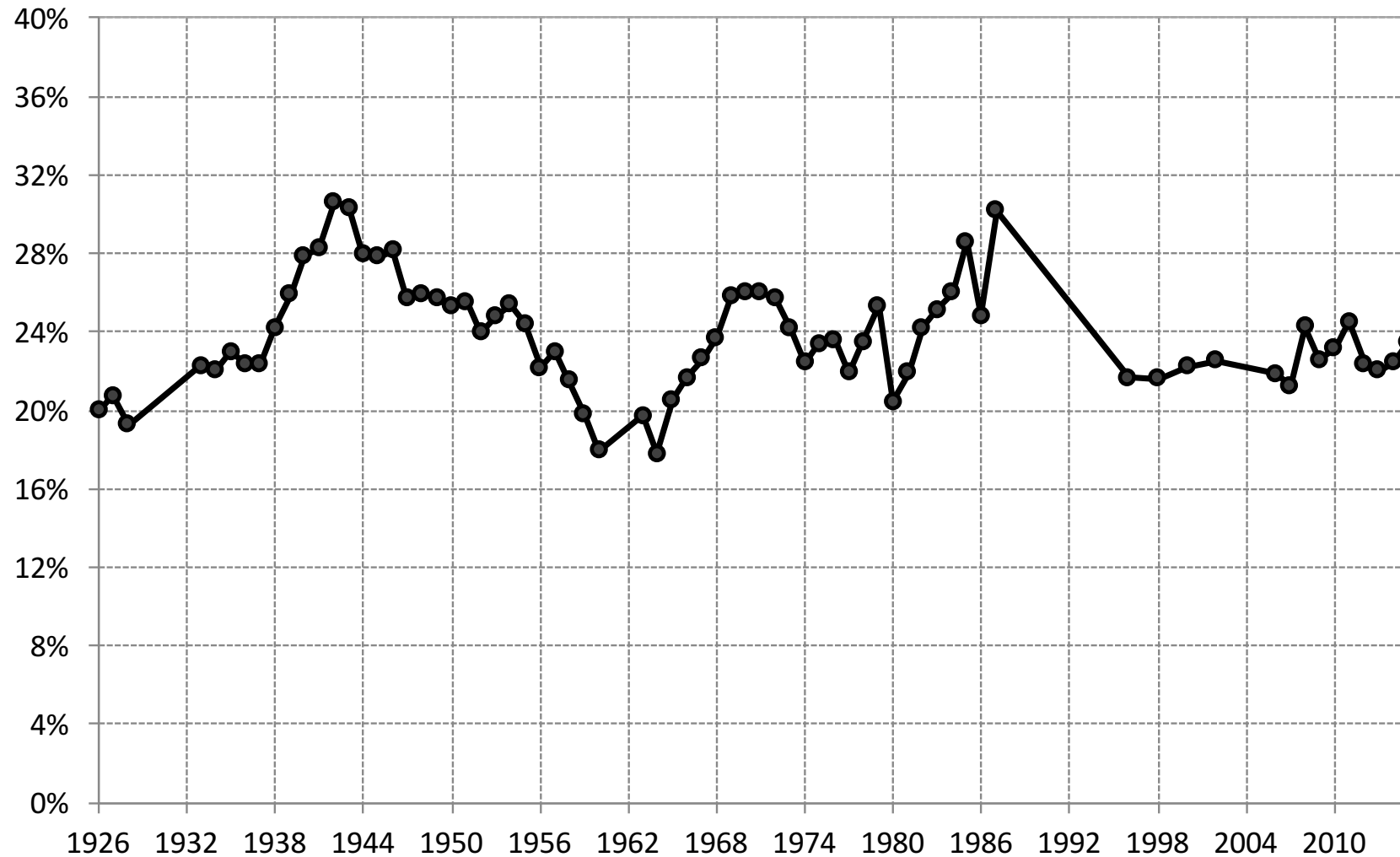
- Exploit tabulations of social contributions (1995-2015)
- Combine with PNAD survey contributors

Inequality over the long-run of Brazilian history

- 1926-1988 income tax tabulations (IBGE) & scattered publications for late-1990s → long run fiscal income series (Morgan and Souza, forthcoming).
- Exploit 1976-1999 survey micro-data and samples of census data (1960, 1970, 1980, 1991, 2000, 2010) → DINA

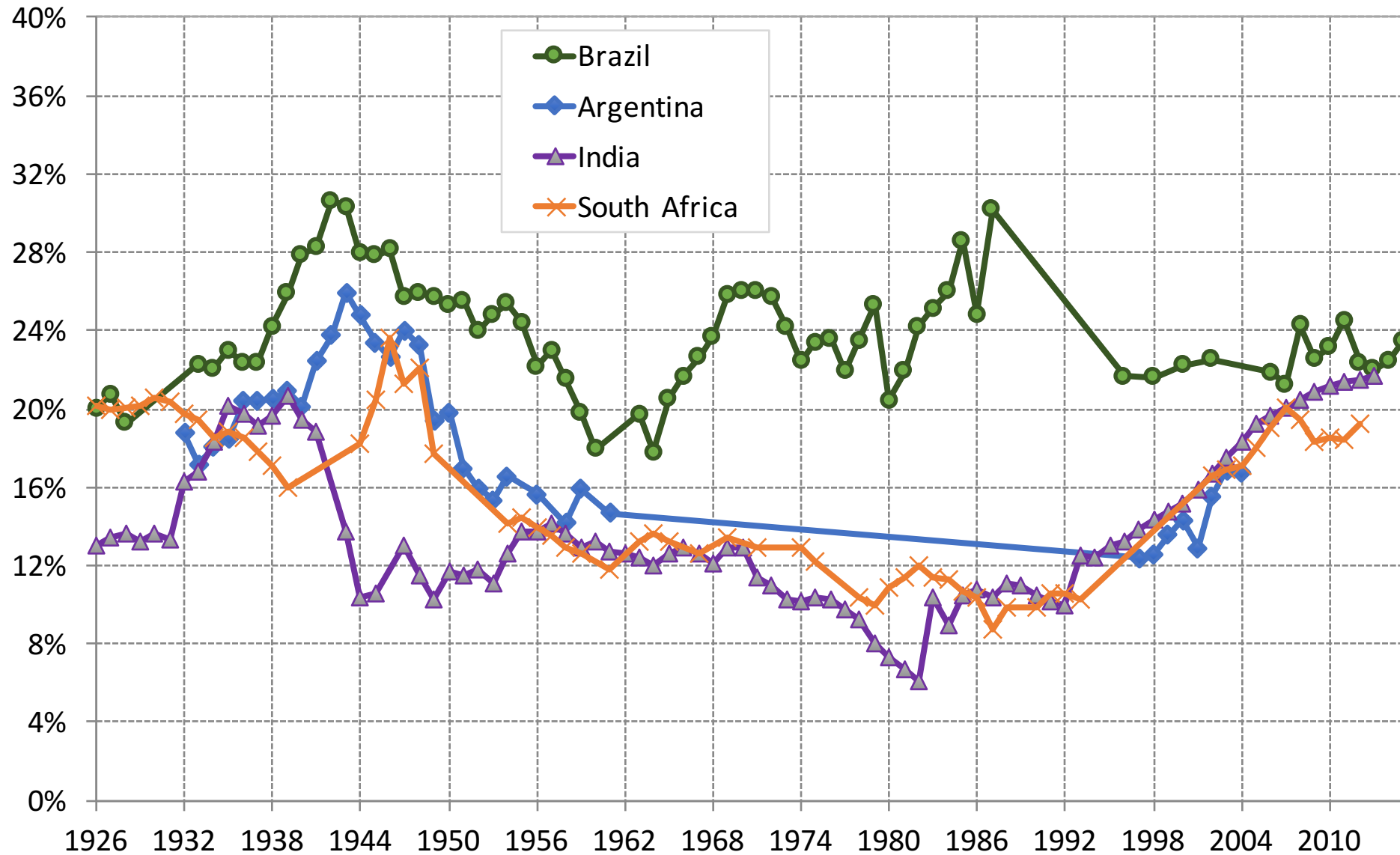
Historical persistence...? (Morgan & Souza, forthcoming)

Top 1% share of fiscal income in Brazil: 1926-2015 (preliminary series)



Notes: Morgan and Souza (forthcoming), using income tax tabulations and SNA.

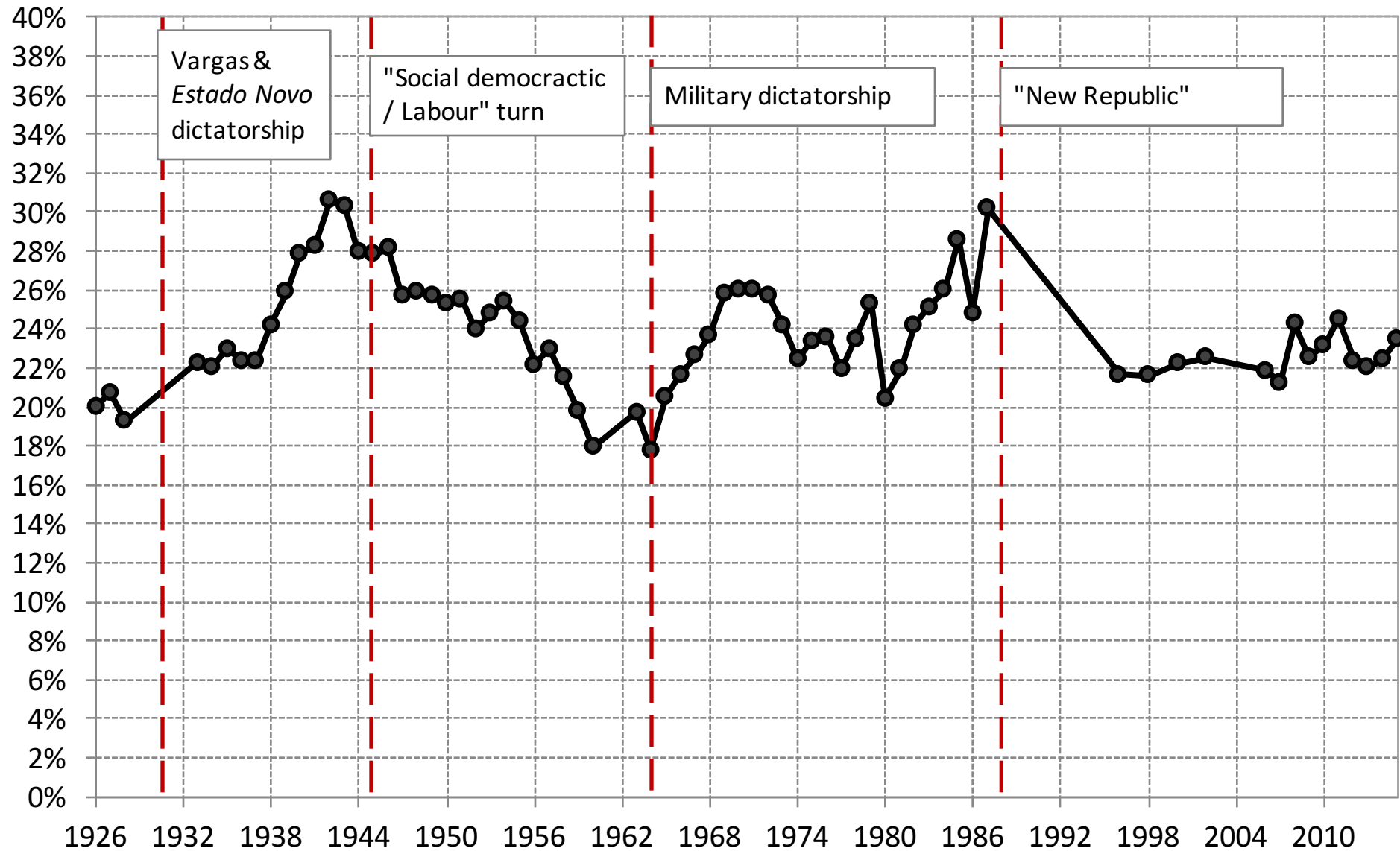
Top 1% share of fiscal income in Brazil: missed 20th century leveling?



Notes: Morgan and Souza (forthcoming), using income tax tabulations and SNA.

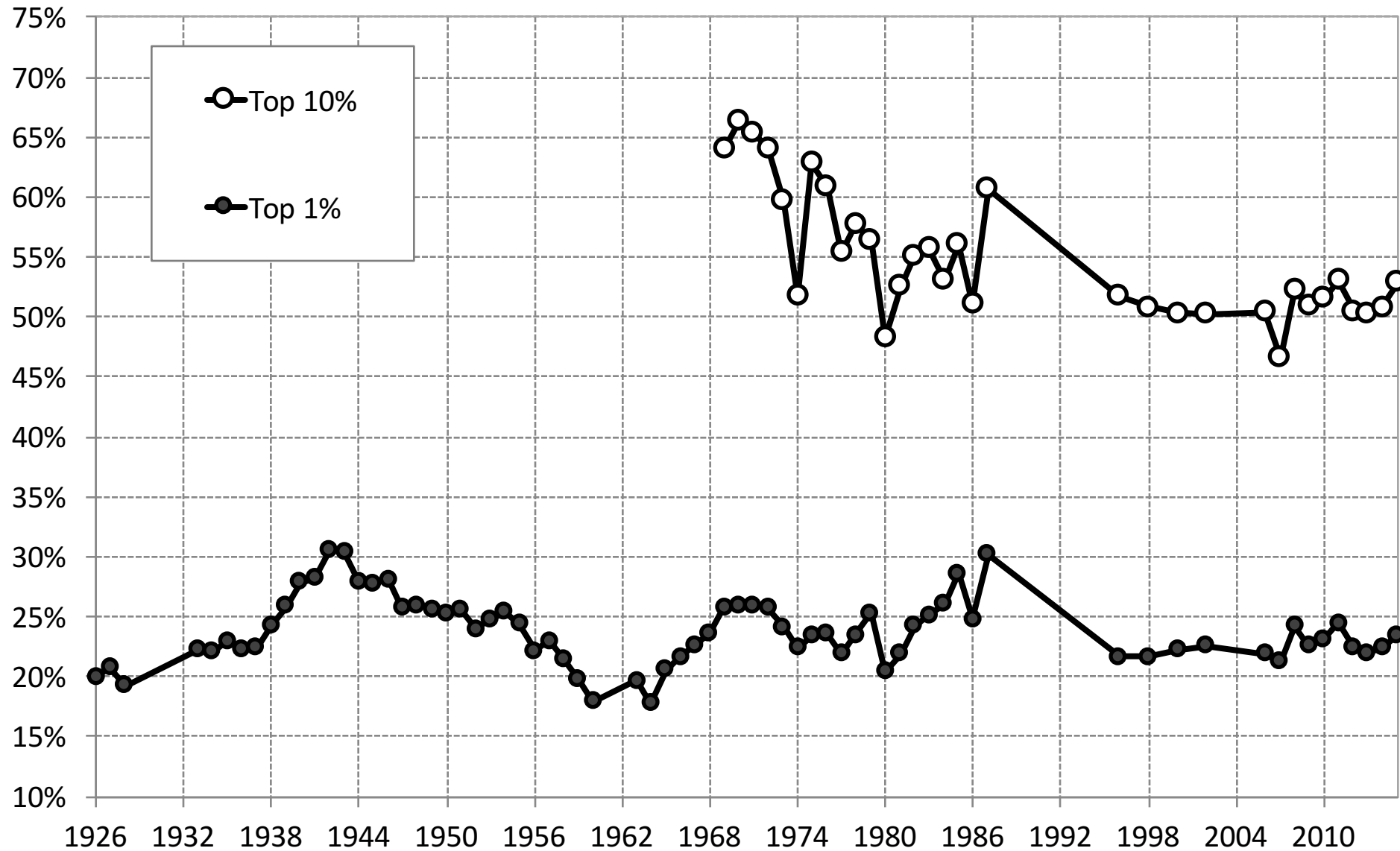
Appendix

Top 1% share of fiscal income in Brazil: 1926-2015 (preliminary series)



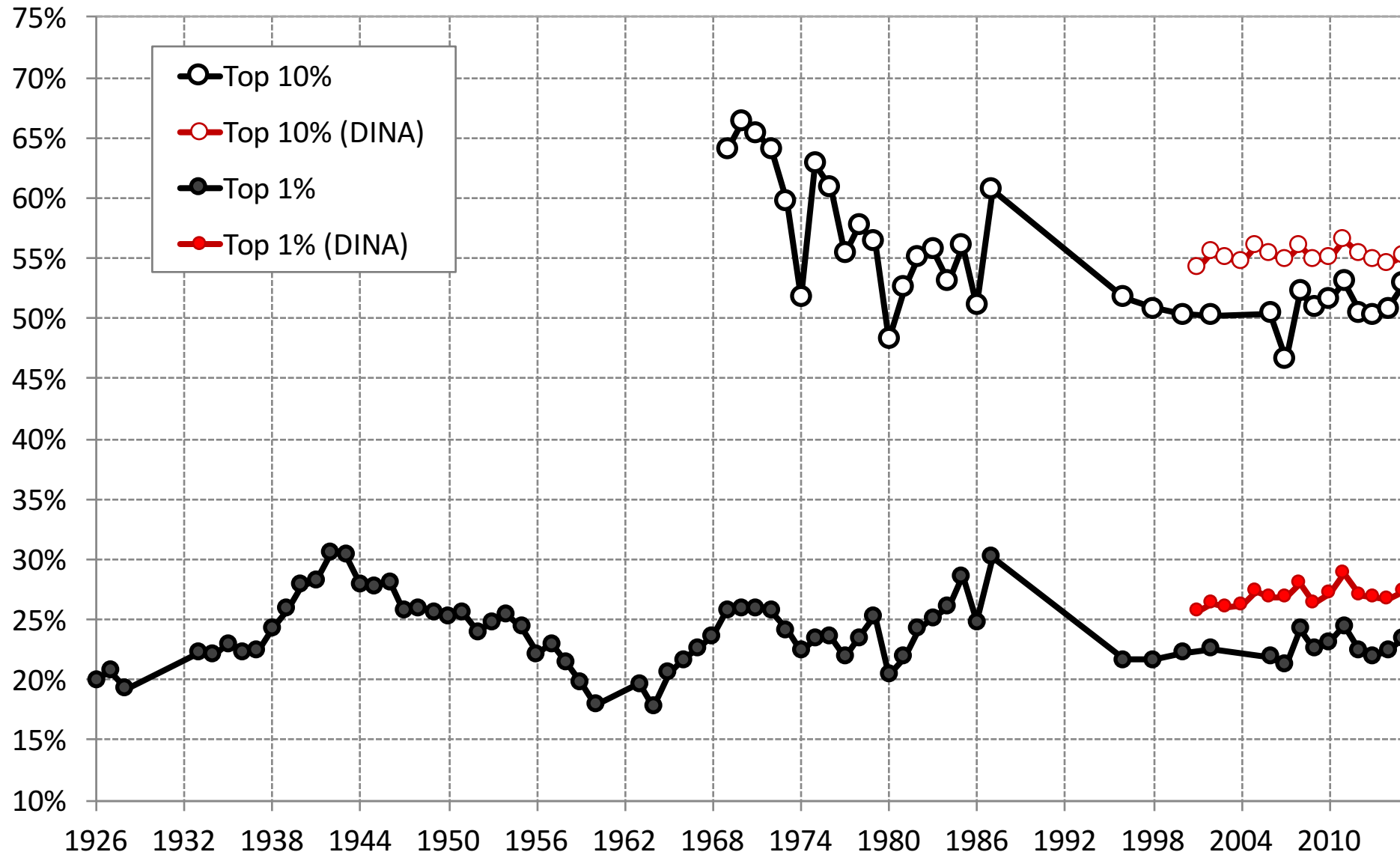
Notes: Morgan and Souza (forthcoming), using income tax tabulations and SNA.

Top shares of fiscal income in Brazil: 1926-2015 (preliminary series)



Notes: Morgan and Souza (forthcoming), using income tax tabulations and SNA.

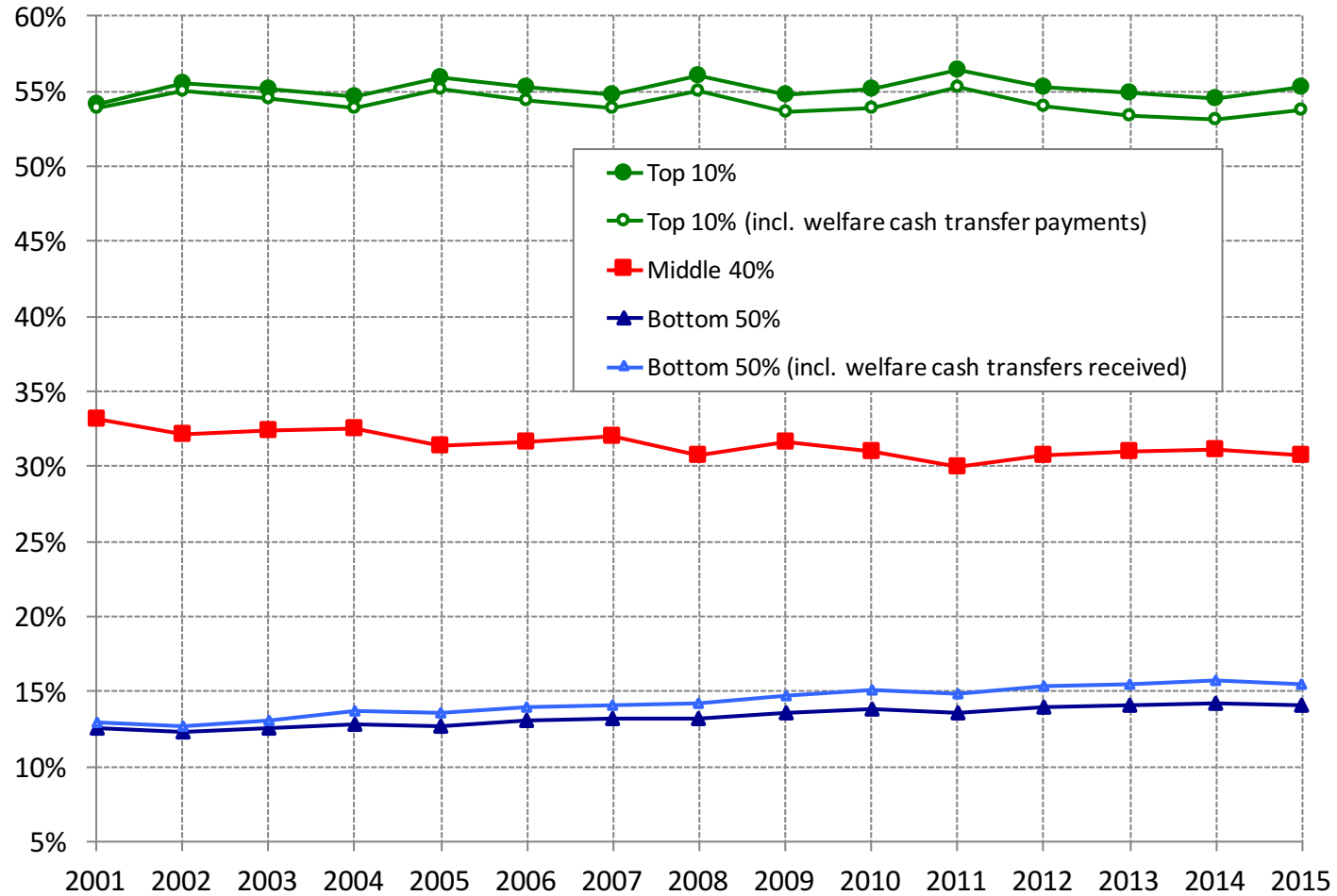
Top shares of fiscal income in Brazil vs DINA shares



Notes: Morgan and Souza (forthcoming), using income tax tabulations and SNA.

Limits of cash transfers

Figure A.5 Income inequality in Brazil: DINA estimates (incl. cash transfers)



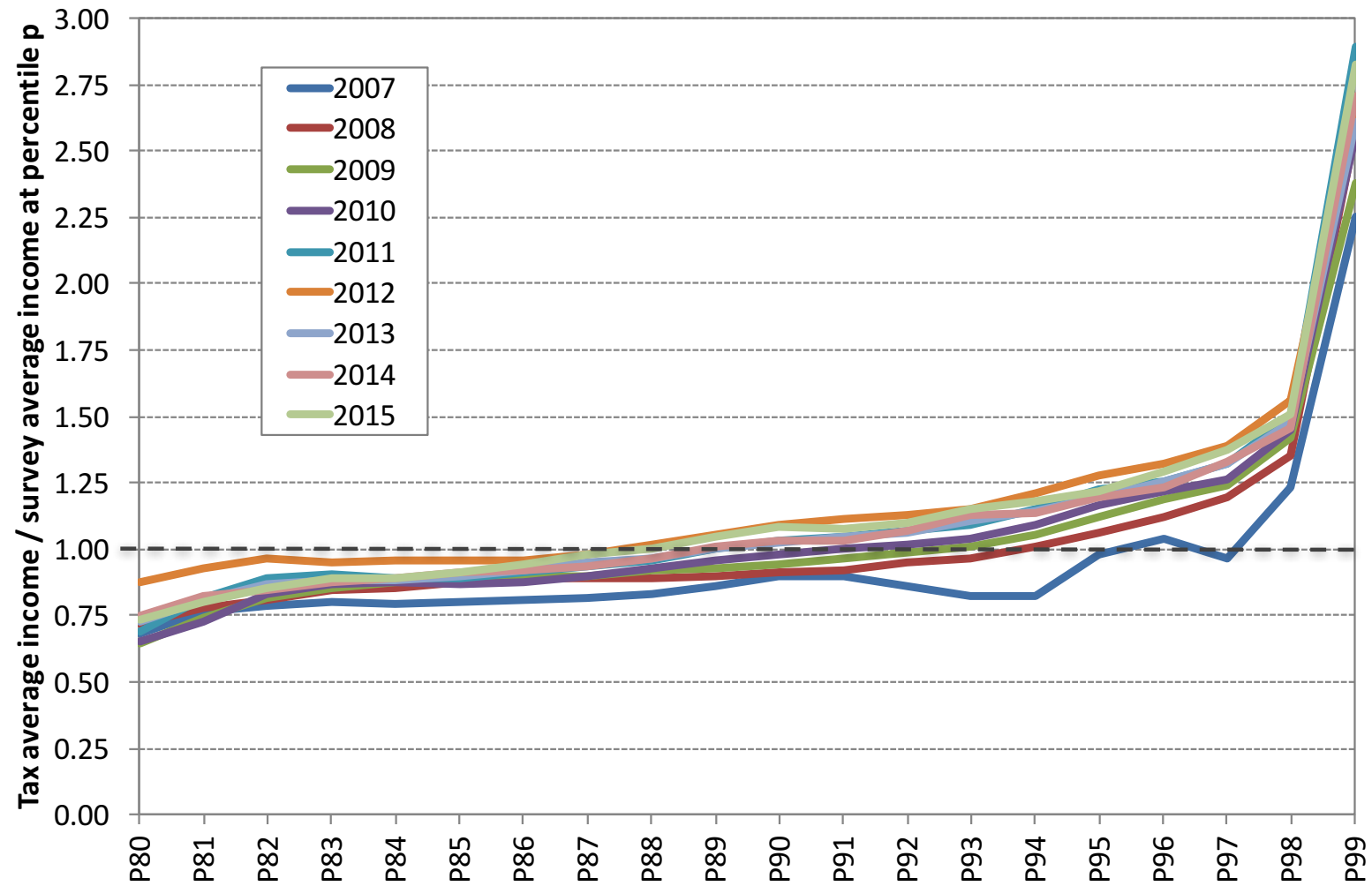
Notes: Distribution of pretax national income (before taxes and transfers, except pensions and unemployment insurance) among adults. Corrected estimates (combining survey, fiscal and national accounts data). Equal-split-adults series (income of married couples divided by two). The annual share of social assistance transfers in national income is added to the share of the Bottom 50% and taken away from the share of the Top 10% to illustrate the maximum inequality reduction that can be achieved with these benefits at their current levels.

Table 1. Comparison of incomes in the System of National Accounts (SNA), Household Surveys (PNAD) and Income Tax Declarations (DIRPF)

Year	Total income (% national income)				<i>Incl. labour income (% national income)</i>				<i>Incl. capital income (% national income)</i>			
	SNA National Income	SNA Fiscal Income	PNAD	DIRPF	SNA National Labour Income	SNA Fiscal Labour Income	PNAD Labour Income	DIRPF Labour Income	SNA National Capital Income	SNA Fiscal Capital Income	PNAD Capital Income	DIRPF Capital Income
2001	100%	78%	63%		71%	60%	50%		29%	17%	12%	
2002	100%	77%	62%		71%	61%	49%		29%	16%	12%	
2003	100%	74%	60%		70%	60%	48%		30%	14%	12%	
2004	100%	71%	58%		68%	58%	46%		32%	14%	11%	
2005	100%	72%	59%		69%	59%	48%		31%	13%	11%	
2006	100%	72%	60%		69%	60%	48%		31%	12%	12%	
2007	100%	71%	58%	42%	69%	59%	48%	33%	31%	12%	10%	9%
2008	100%	71%	58%	46%	69%	59%	48%	35%	31%	12%	10%	11%
2009	100%	73%	59%	46%	73%	61%	49%	35%	27%	12%	10%	11%
2010	100%	71%	56%	45%	70%	59%	47%	34%	30%	12%	9%	11%
2011	100%	71%	54%	46%	70%	59%	46%	34%	30%	12%	8%	12%
2012	100%	71%	56%	46%	70%	60%	47%	34%	30%	11%	9%	12%
2013	100%	71%	55%	45%	71%	60%	46%	33%	29%	11%	8%	12%
2014	100%	73%	57%	47%	73%	62%	48%	35%	27%	11%	9%	12%
2015	100%	75%	58%	49%	75%	64%	49%	36%	25%	12%	8%	13%

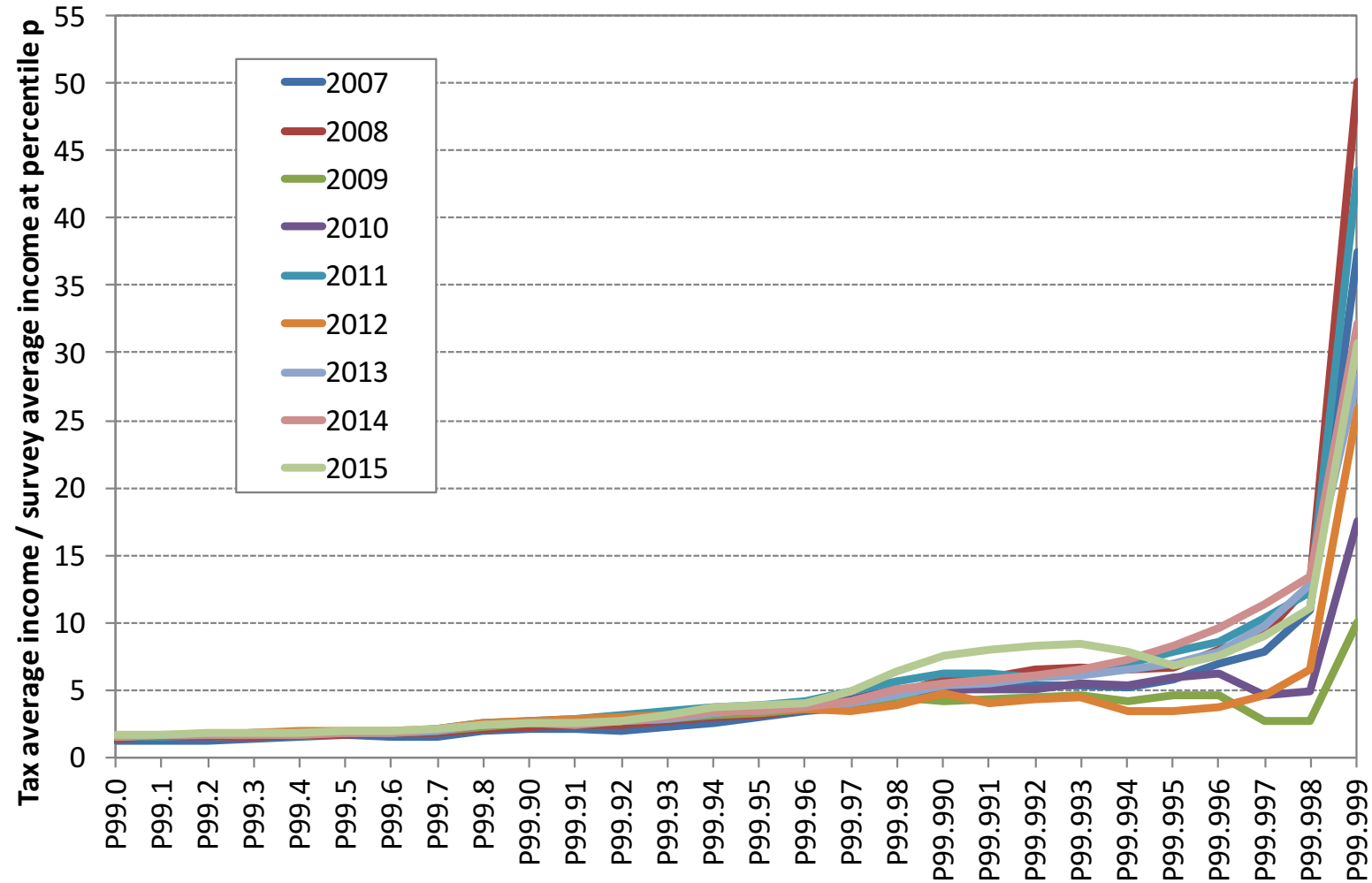
Notes: The table shows the ratio of the income of each dataset to the total net national income of the economy. For instance in 2015, the total income we measure in the tax data accounts for 49% of national income, while the equivalent income concept from the survey is 58%. The equivalent income concept estimated from national accounts is 75% of national income. While 75% of total national income is labour income, 64% is labour income defined for fiscal purposes, 49% is labour income in the survey and 36% is labour income in the tax data. The PNAD incomes are from the microfiles provided by the IBGE, while incomes from the DIRPF are from detailed tabulations provided by the Secretaria da Receita Federal do Brasil. SNA data is from IBGE. Percentages may not add up due to rounding. Mixed income is divided up between labour and capital income in proportion to the division of income between employee remuneration and net operating surplus in the corporate sector. On average the split is 61%-39% between labour and capital.

**Figure A.1. Ratios between tax and survey average incomes in Brazil:
2007-2015**



Notes: the figure shows ratios between average incomes in the tax data and average incomes in surveys for each percentile of the two respective distributions. Tax data start at around P80 for all years.

**Figure A.2. Ratios between tax and survey average incomes in Brazil
above P99: 2007-2015**



Notes: the figure shows ratios between average incomes in the tax data and average incomes in surveys for each percentile of the two respective distributions. Tax data start at around P80 for all years.

Step 3: How is imputed income distributed?

Imputed rent → distribution from POF (29.6% to Top 10% incl. 7.5% to Top 1%, 44.3% to Middle 40%, and 26.1% to Bottom 50%)

Social contributions → distribution from POF (49.4% to Top 10% incl. 13.1% to Top 1%, 44.2% to Middle 40%, and 6.4% to Bottom 50%)

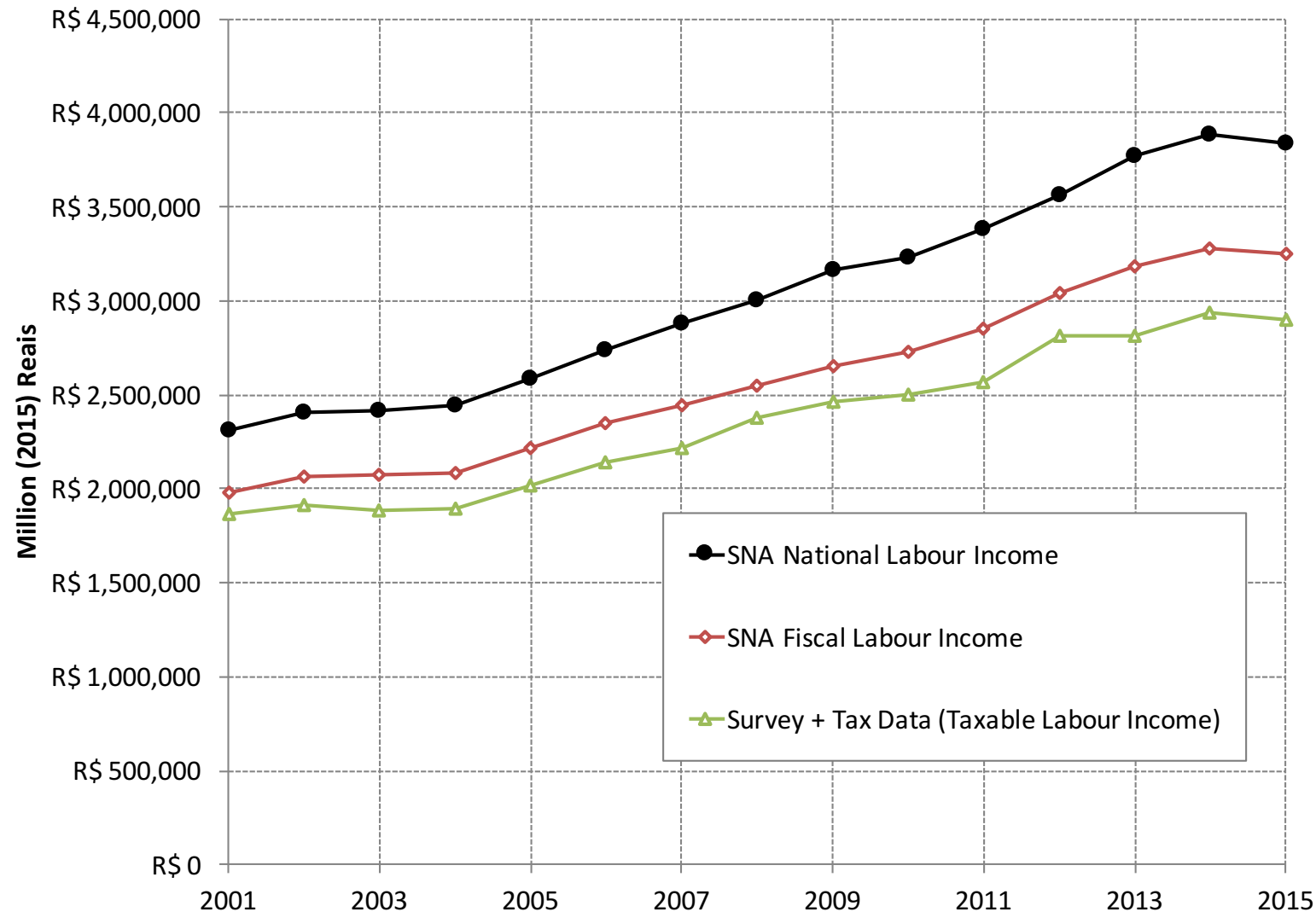
Undistributed profits → distribution of financial incomes & employer capital income (PNAD)

Insurance/pension fund income → distribution of primary job of those who contribute to public or private pension fund (PNAD)

→ 90.5% to Top 10% (incl. 53.7% to Top 1%) 9.2% to Middle 40%, and 0.3% to Bottom 50% on average

Government income → distribution neutral

Figure A.3. Evolution of labour income in Brazil: 2001-2015



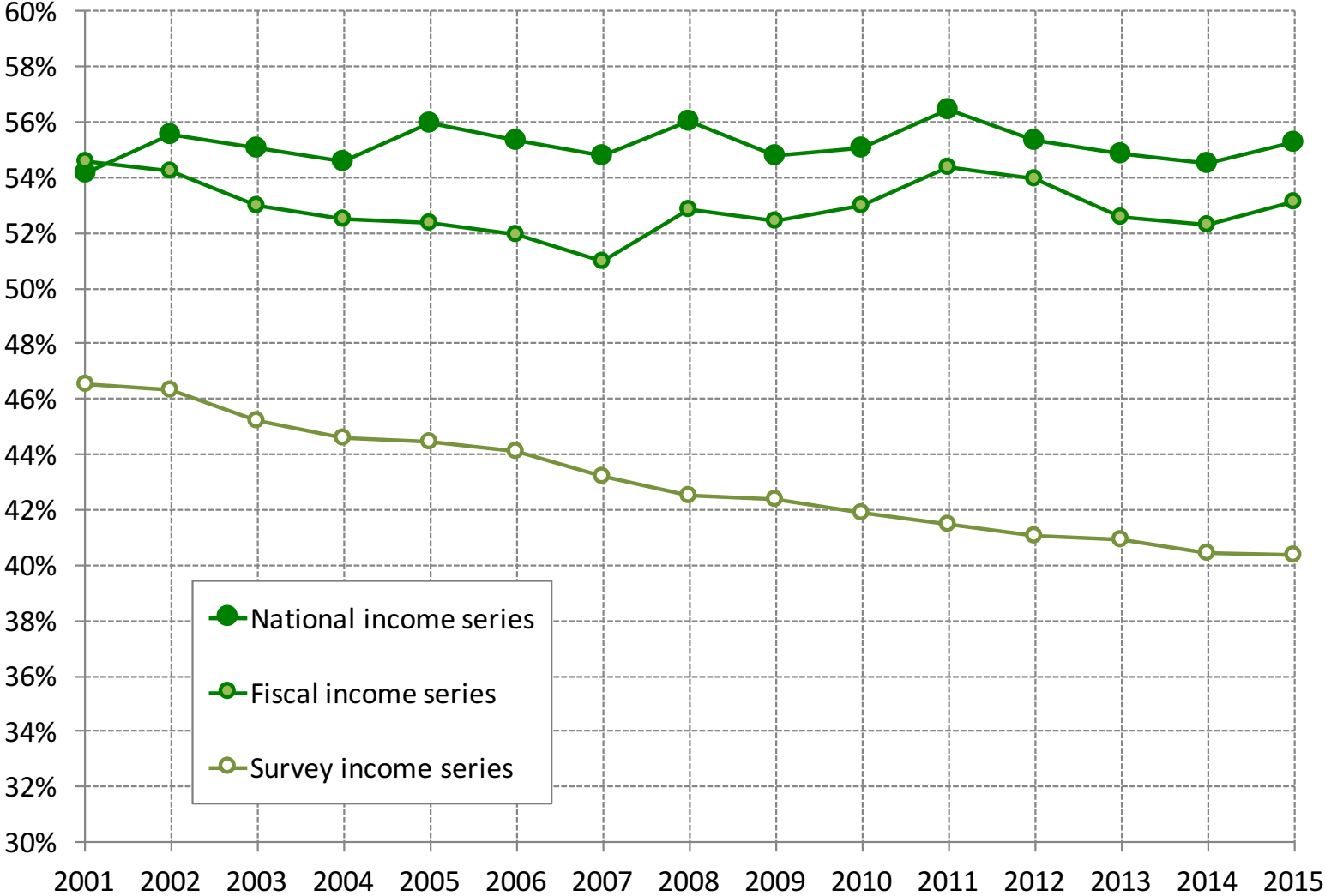
Notes: The figure shows the evolution of total real labour income in millions of Reals across datasets and income concepts. The Survey + Tax data series combines taxable labour income assessed for tax purposes in the two datasets. Taxable labour income includes wages, pensions and self-employment *pro-labore* income on which the income tax applies. The difference with SNA fiscal labour income is that it excludes annual bonuses, the exempt portions of pensions and agricultural income, indemnity income for the termination of a contract and unemployment insurance. The difference with national labour income is that it excludes employer fringe benefits and payroll taxes and any potential tax evasion.

Table 4. Income growth, recession and inequality in Brazil: 2001-2015

Income groups (distribution of per adult pre-tax national income)	Total cumulated growth (2001-2015)	Fraction of total growth captured (2001-2015)	Average income share (2001-2015)	Total cumulated growth (2001-2007)	Total cumulated growth (2007-2015)	Total growth (2014-2015)
Full population	18.2%	100.0%	100.0%	10.4%	7.1%	-5.5%
Bottom 50%	31.4%	21.8%	13.3%	15.2%	14.1%	-7.1%
Middle 40%	9.3%	16.9%	31.5%	6.5%	2.6%	-7.0%
Top 10%	20.6%	61.3%	55.2%	11.6%	8.0%	-4.2%
<i>incl. Top 1%</i>	<i>25.9%</i>	<i>36.5%</i>	<i>26.9%</i>	<i>15.5%</i>	<i>9.0%</i>	<i>-3.3%</i>
<i>incl. Top 0.1%</i>	<i>21.3%</i>	<i>14.7%</i>	<i>12.6%</i>	<i>13.1%</i>	<i>7.2%</i>	<i>-0.7%</i>
<i>incl. Top 0.01%</i>	<i>84.8%</i>	<i>22.3%</i>	<i>7.2%</i>	<i>119.9%</i>	<i>-16.0%</i>	<i>-2.2%</i>
<i>incl. Top 0.001%</i>	<i>121.5%</i>	<i>13.8%</i>	<i>3.7%</i>	<i>196.8%</i>	<i>-25.4%</i>	<i>-0.8%</i>

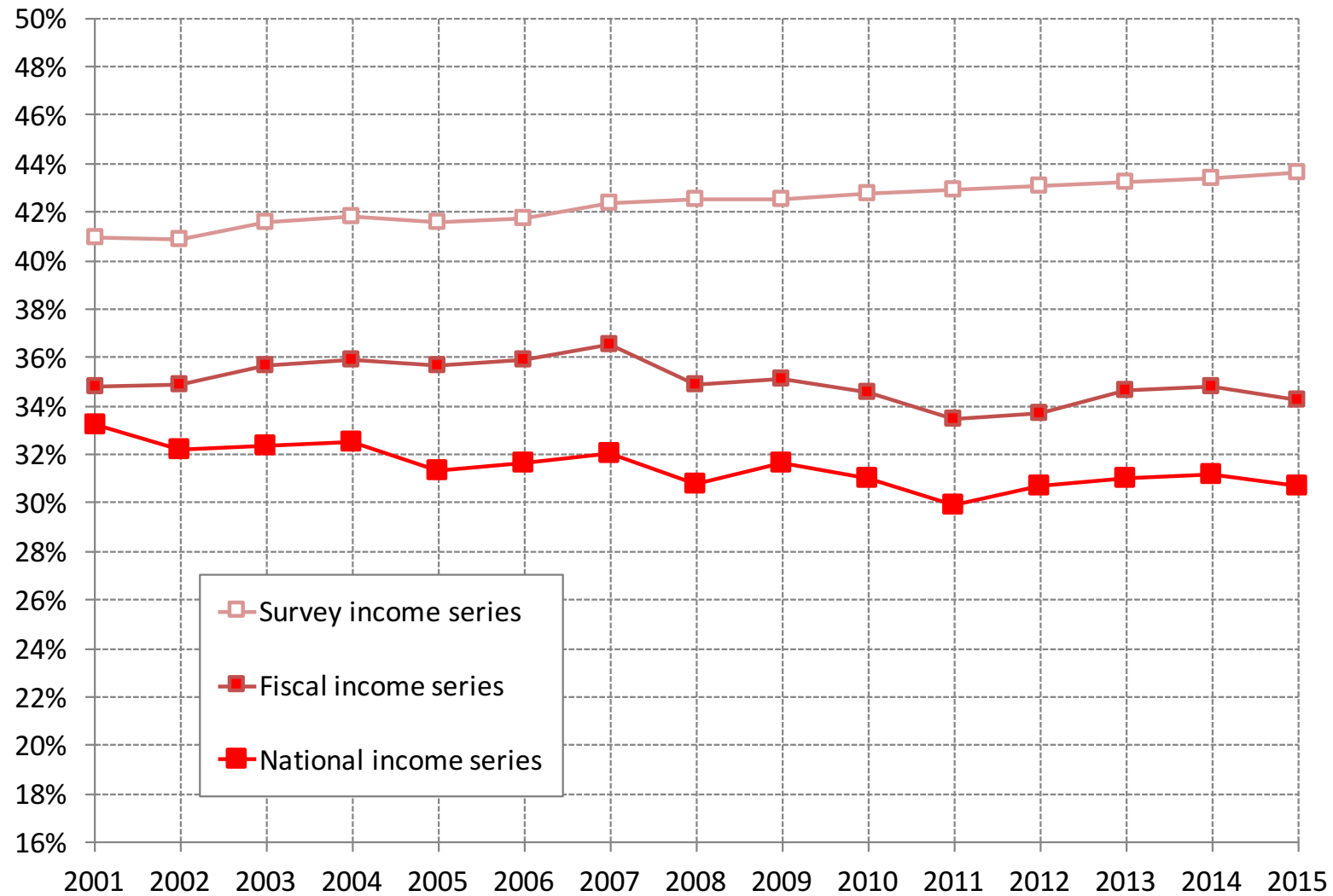
Notes: Distribution of pre-tax national income among equal-split adults. The unit is the adult individual (20-year-old and over; income of married couples is split into two). Fractiles are defined relative to the total number of adult individuals in the population. Corrected estimates (combining survey, fiscal and national accounts data).

Figure 5. Top 10% in Brazil: survey vs fiscal vs DINA series



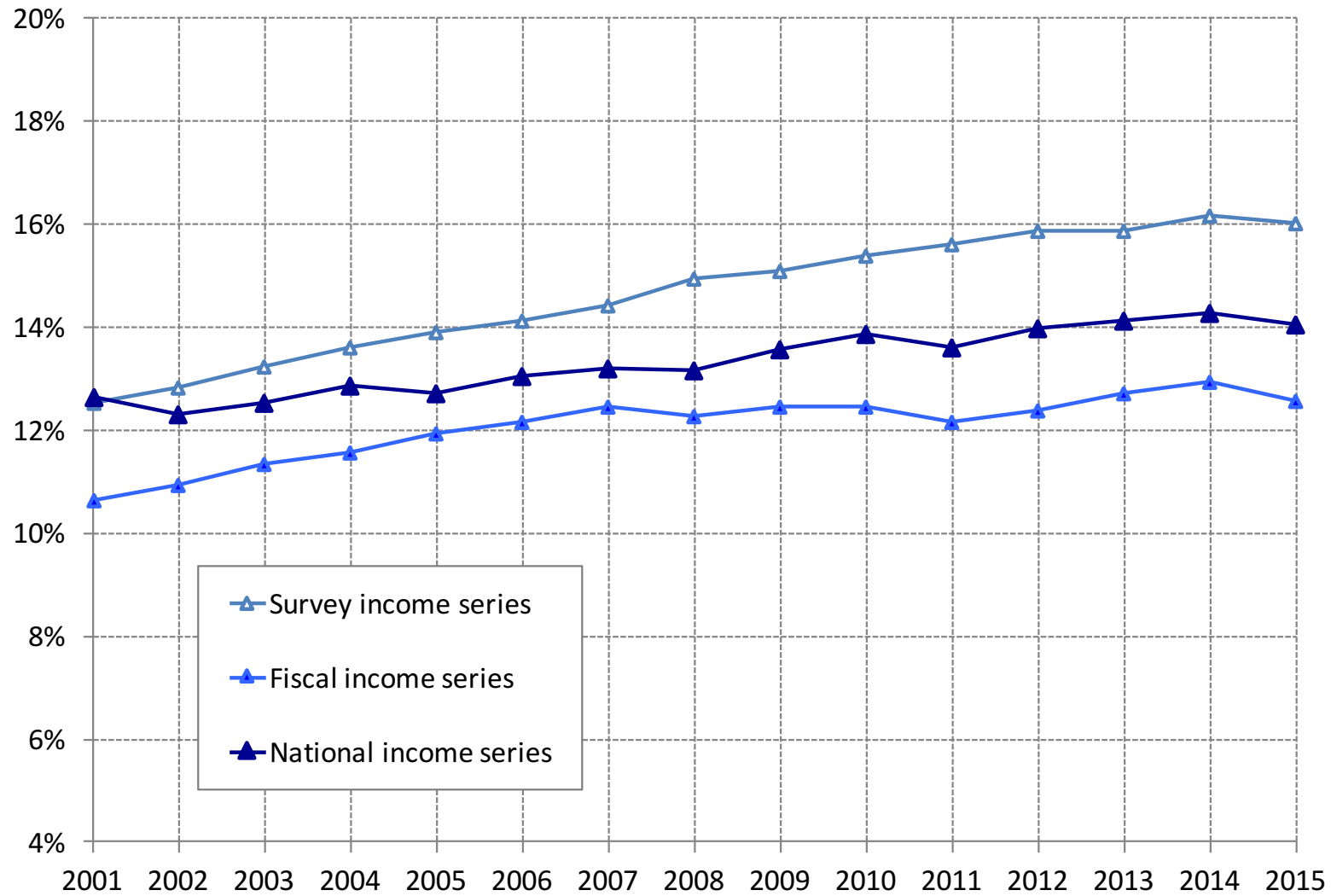
Notes: Distribution of income (before taxes and transfers, except pensions and unemployment insurance) among adults in our three series, raw estimates from surveys, a fiscal income series (combining surveys and fiscal data) and a national income series (combining national accounts, surveys and fiscal data). Equal-split-adults series (income of married couples divided by two).

Figure 6. Middle 40% in Brazil: survey vs fiscal vs DINA series



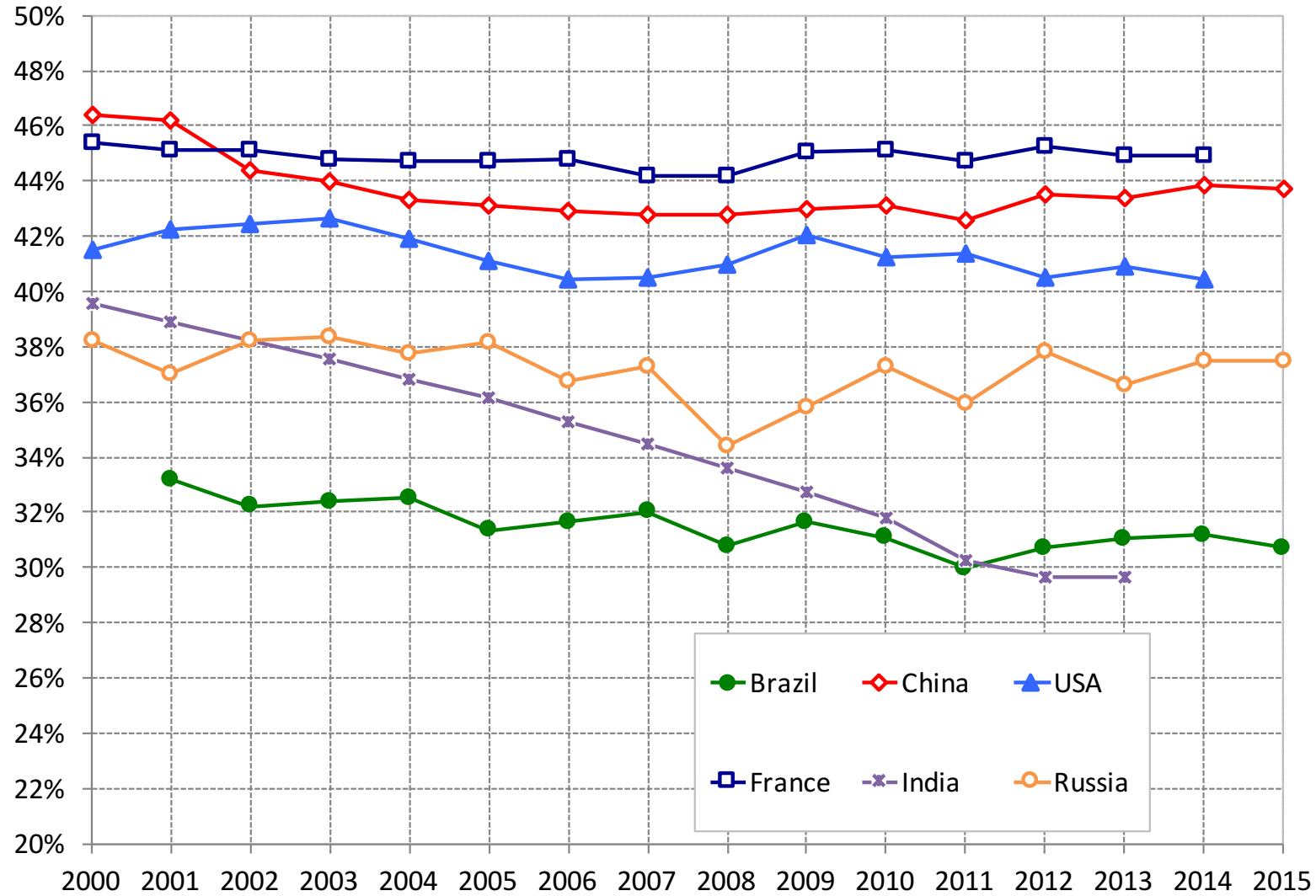
Notes: Distribution of income (before taxes and transfers, except pensions and unemployment insurance) among adults in our three series, raw estimates from surveys, a fiscal income series (combining surveys and fiscal data) and a national income series (combining national accounts, surveys and fiscal data). Equal-split-adults series (income of married couples divided by two).

Figure 7. Bottom 50% in Brazil: survey vs fiscal vs DINA series



Notes: Distribution of income (before taxes and transfers, except pensions and unemployment insurance) among adults in our three series, raw estimates from surveys, a fiscal income series (combining surveys and fiscal data) and a national income series (combining national accounts, surveys and fiscal data). Equal-split-adults series (income of married couples divided by two).

Figure 12. Middle 40% income share: Brazil vs other countries



Notes: Distribution of pretax national income (before taxes and transfers, except pensions and unemployment insurance) among adults. Corrected estimates (combining national accounts, surveys and fiscal data). Equal-split-adults series (income of married couples divided by two). Estimates for USA, France and China, India and Russia are from <http://wid.world/>.

Two final points to note:

- Fall in wage inequality → **change in remuneration forms** ?
 - Self-employed, business owners/executives (tax incentives)

- **Role of undistributed profits** (6% of national income)
 - Growth (273%) vs employee compensation (75%) & dividends (35%)
 - Concentration in Top 1%
 - Why the accumulation: uncertain economic and political landscape...limits to external finance?