

Labour productivity and structural change in Brazil: 1995-2009

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Introduction

- Brazilian economy undergone several transformations in the last two decades due to institutional and structural changes:
 - 1990s: stabilization (Real Plan), liberalization, inflation targeting regime, Fiscal Responsibility Law, “fixed” and floating exchange rate regime etc
 - 2000s: Chinese competition, world financial crisis, deindustrialization(?) etc

What happened with Brazilian labour productivity?

Methodology

- Data:
 - Brazilian National Accounts (IBGE)
 - 42 economic activities
 - 1995-2009 (aggregated)
 - 1995-1999 (disaggregated)
 - 2000-2009 (disaggregated)
 - Average prices 1995-2009
 - Variables:
 - Y: value added
 - N: employment (occupations)
 - P: labour productivity (Y/N)

Methodology

- Growth accounting

$$\hat{Y}_t = \sum_{i=1}^{42} \hat{y}_t^i \times \frac{y_{t-1}^i}{Y_{t-1}} \quad \hat{N}_t = \sum_{i=1}^{42} \hat{n}_t^i \times \frac{n_{t-1}^i}{N_{t-1}}$$

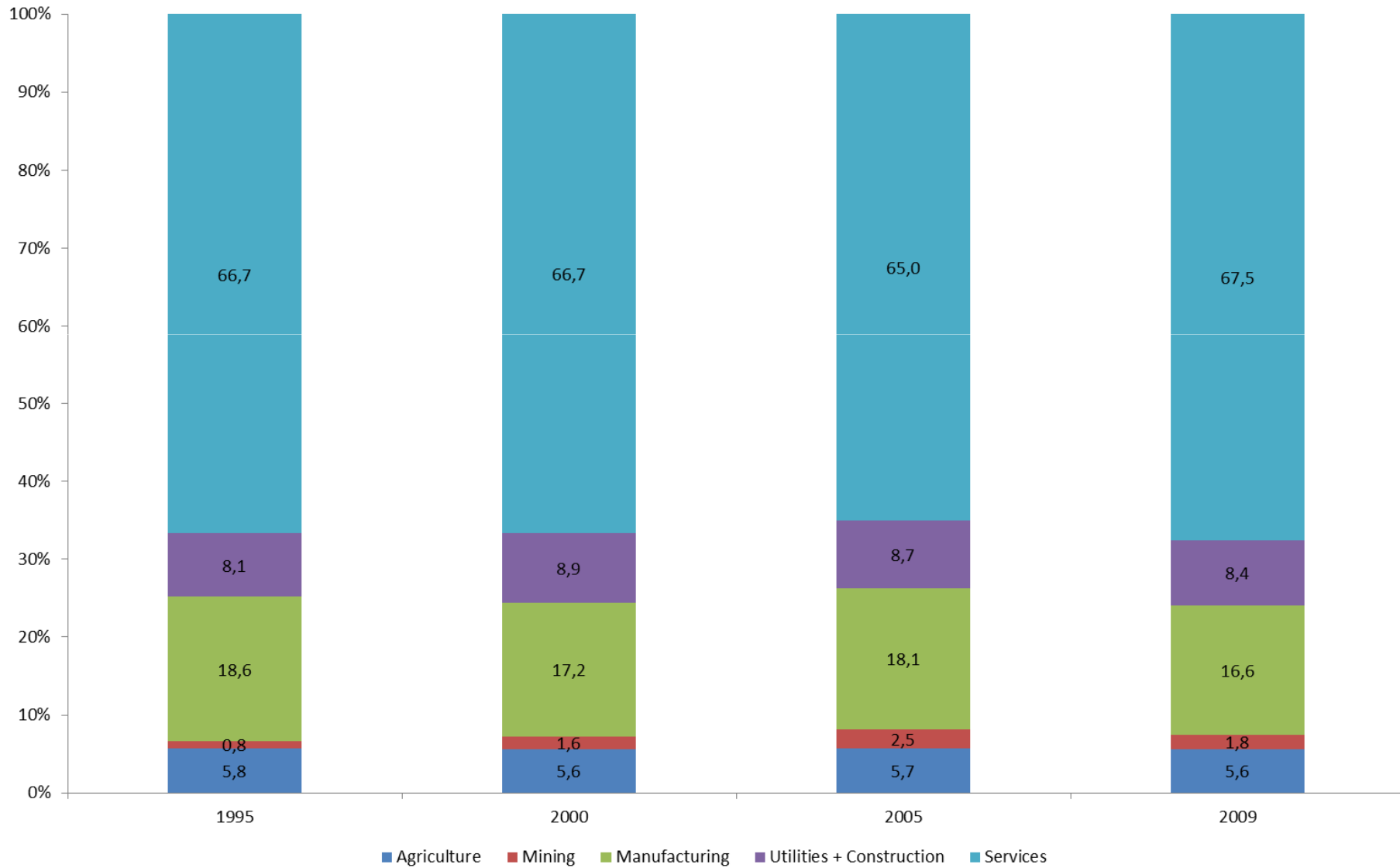
- Decomposition / Shift-share

$$1) P_t = \sum_{i=1}^{42} p_t^i \times \frac{n_t^i}{N_t}$$

$$2) \hat{P}_t = \sum_{i=1}^{42} \left[(p_t^i - p_{t-1}^i) \times \frac{\left(\frac{n_t^i}{N_t} + \frac{n_{t-1}^i}{N_{t-1}} \right)}{2} \right] \\ + \sum_{i=1}^{42} \left[\left(\frac{n_t^i}{N_t} - \frac{n_{t-1}^i}{N_{t-1}} \right) \times \frac{(p_t^i - p_{t-1}^i)}{2} \right]$$

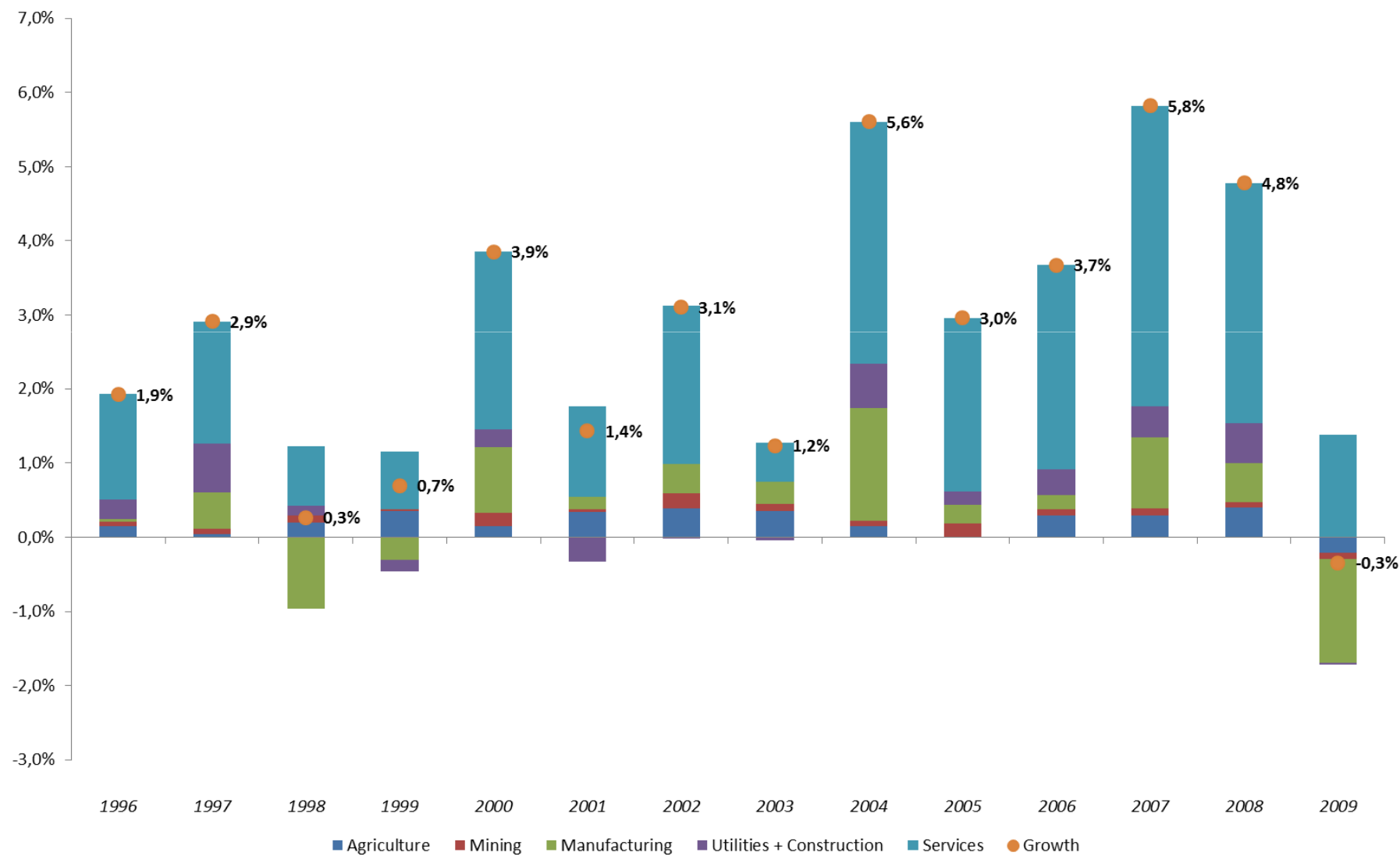
Value added - composition

% of total VA – 1995 / 2000 / 2005 / 2009



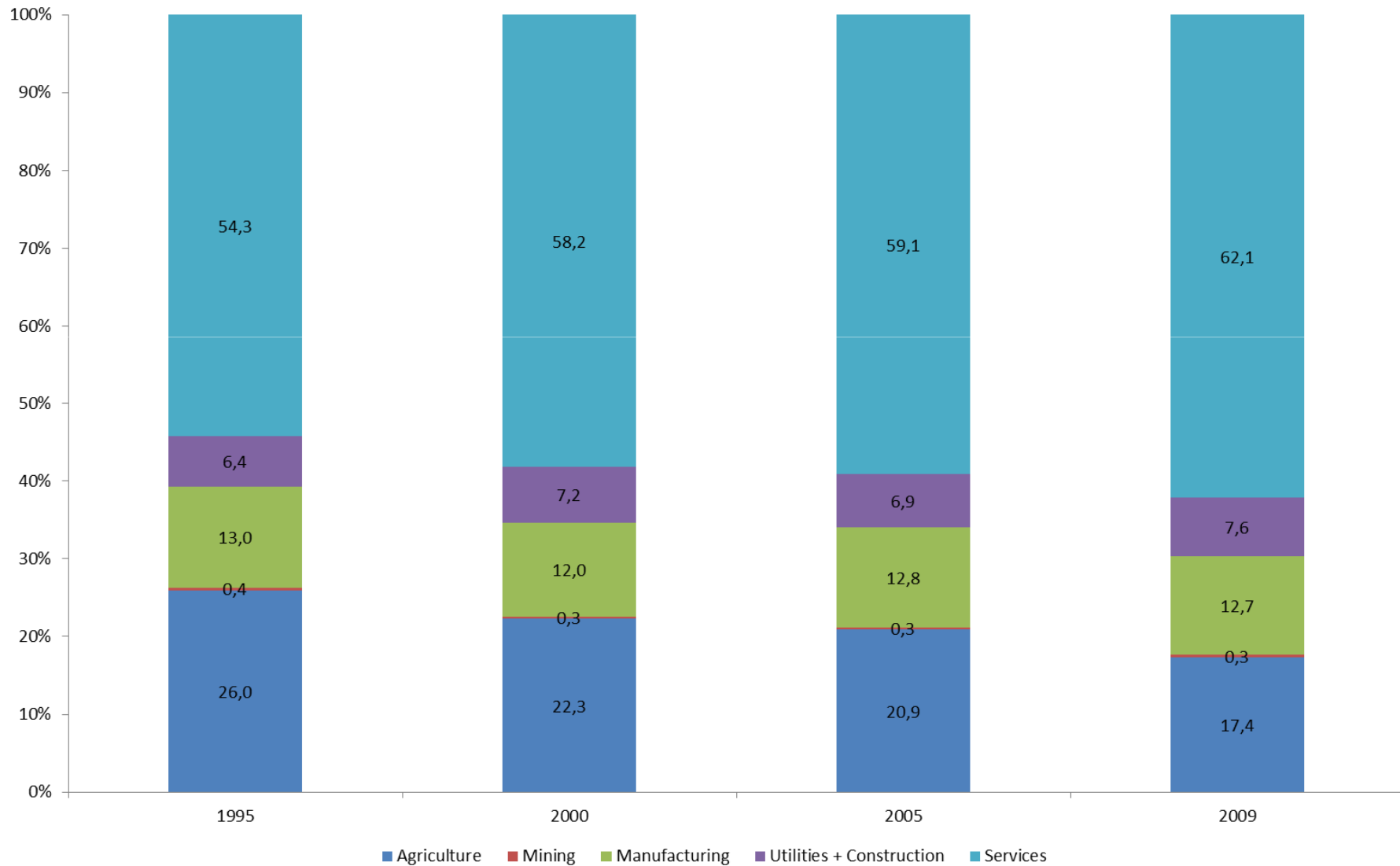
Value added - growth

Sectoral contributions to annual % change – 1996-2009



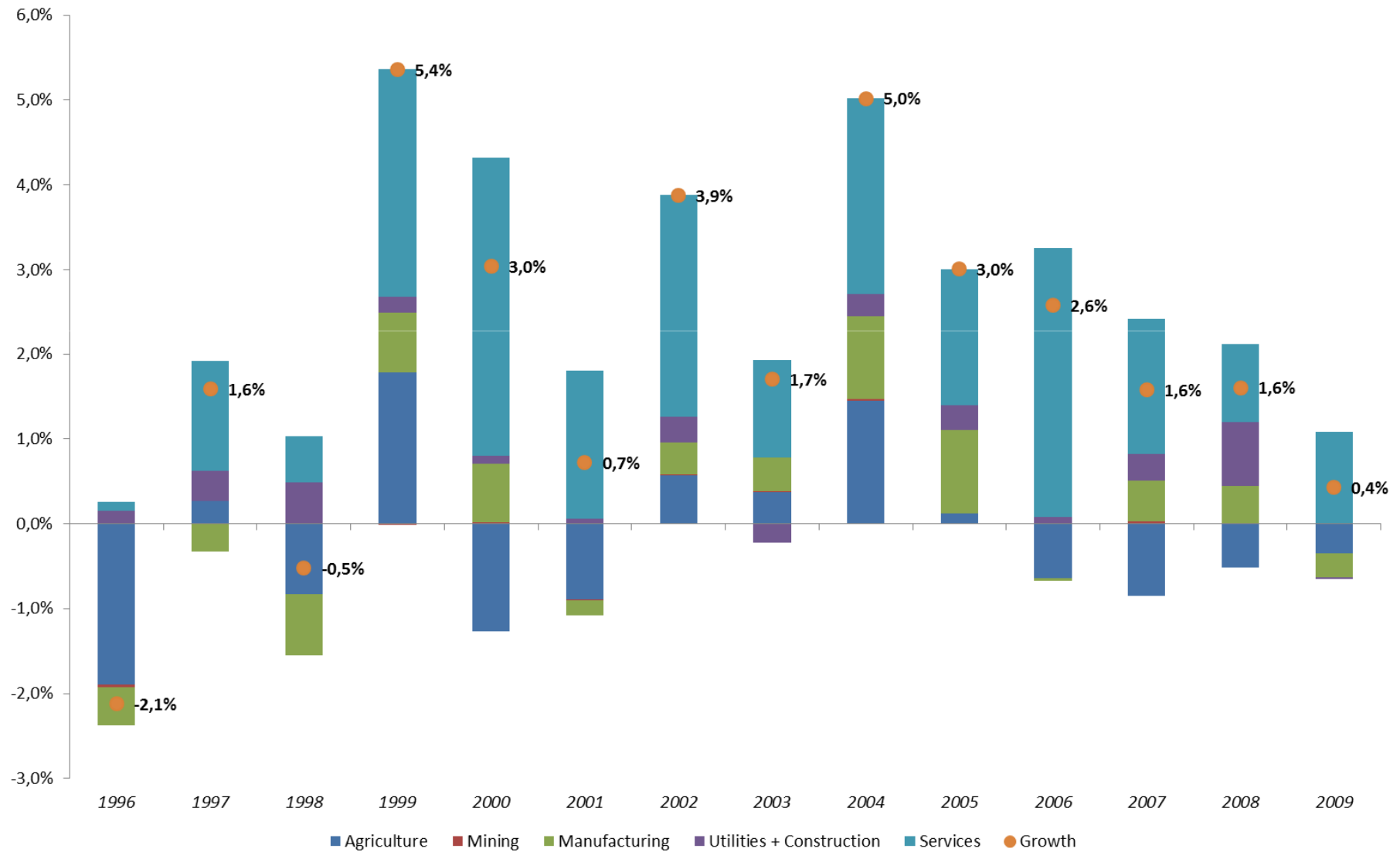
Employment - composition

% of total employment – 1995 / 2000 / 2005 / 2009



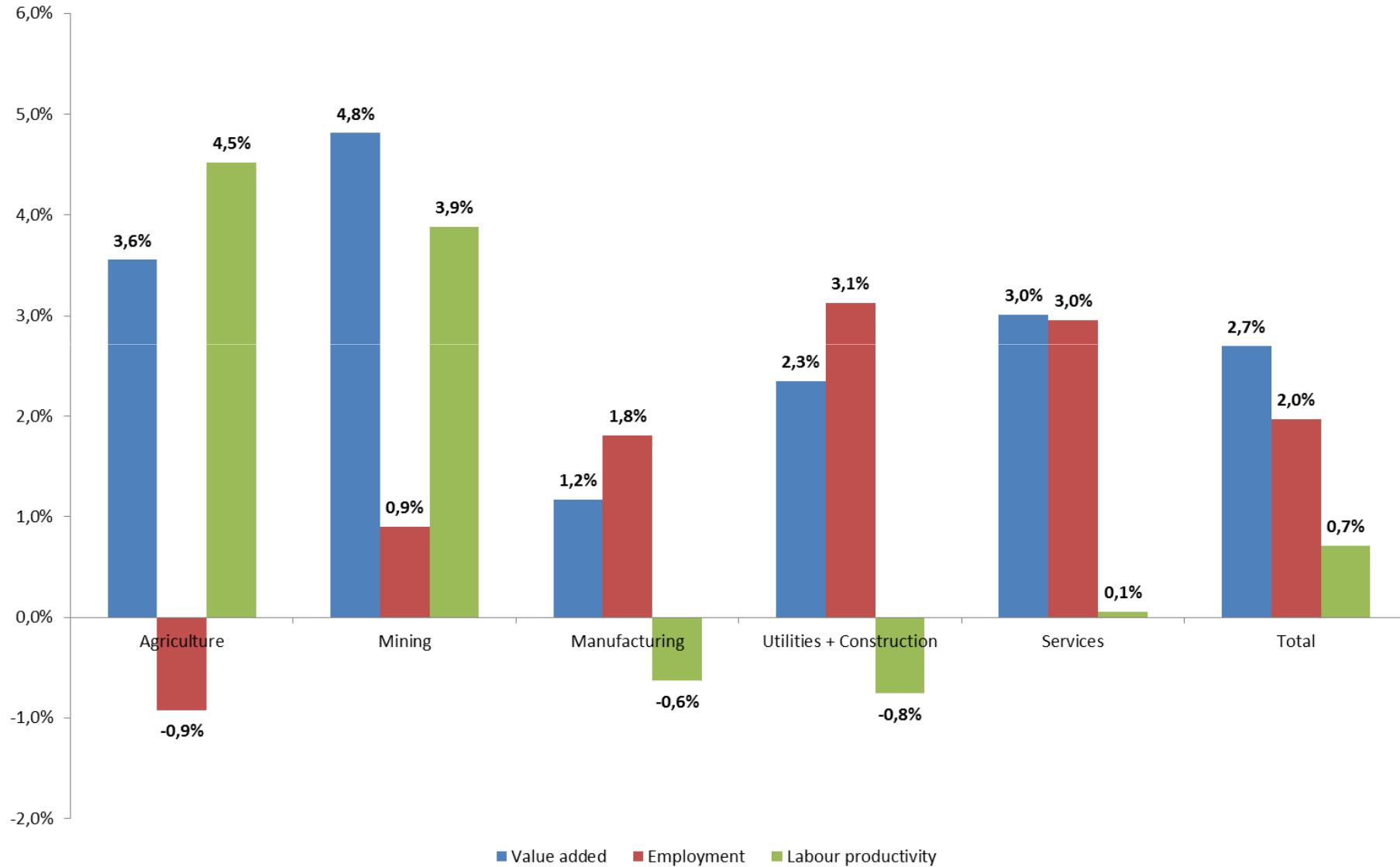
Employment - growth

Contributions to annual % change – 1996-2009



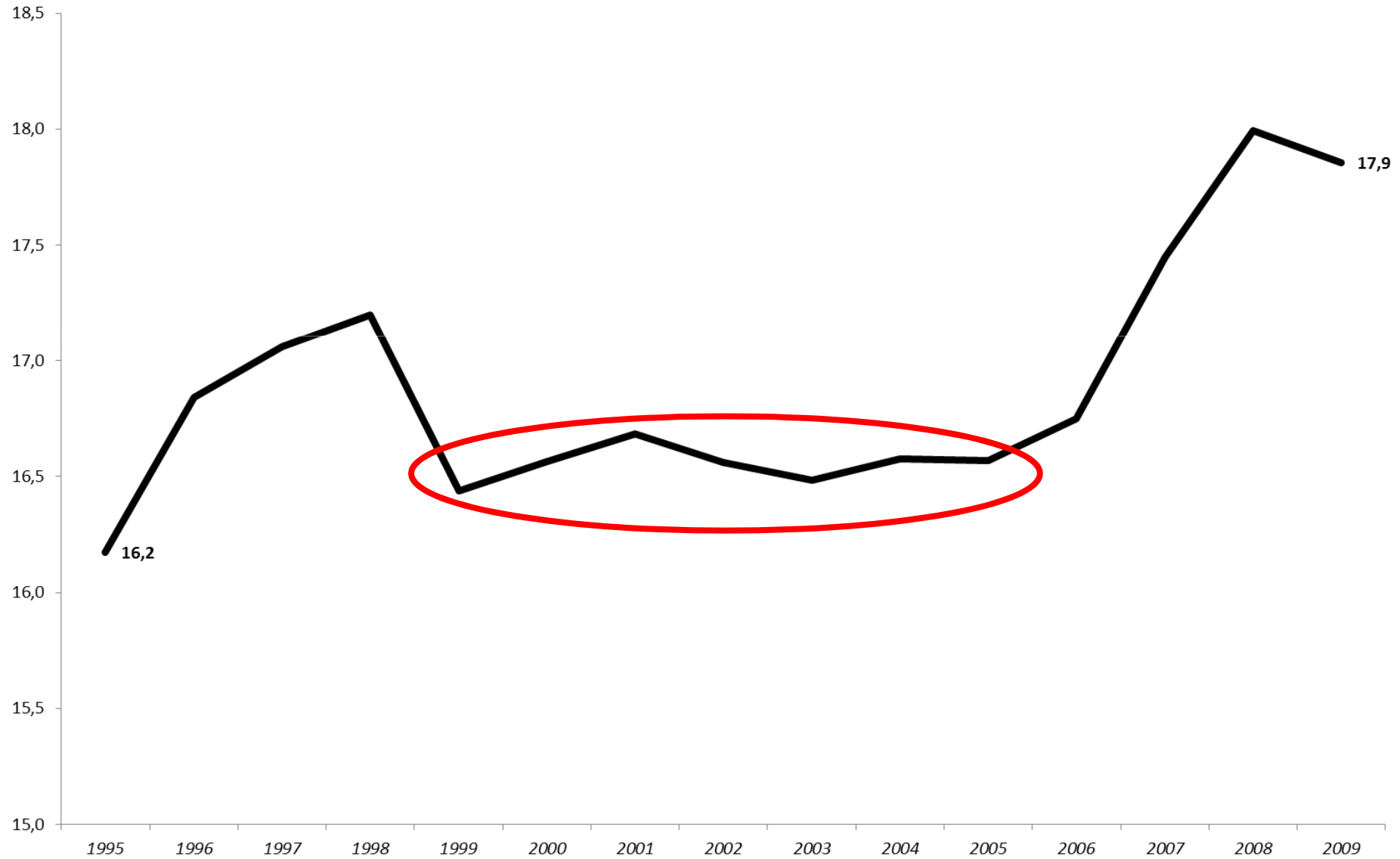
Sectoral growth

Compound annual rate (%) - 1995-2009



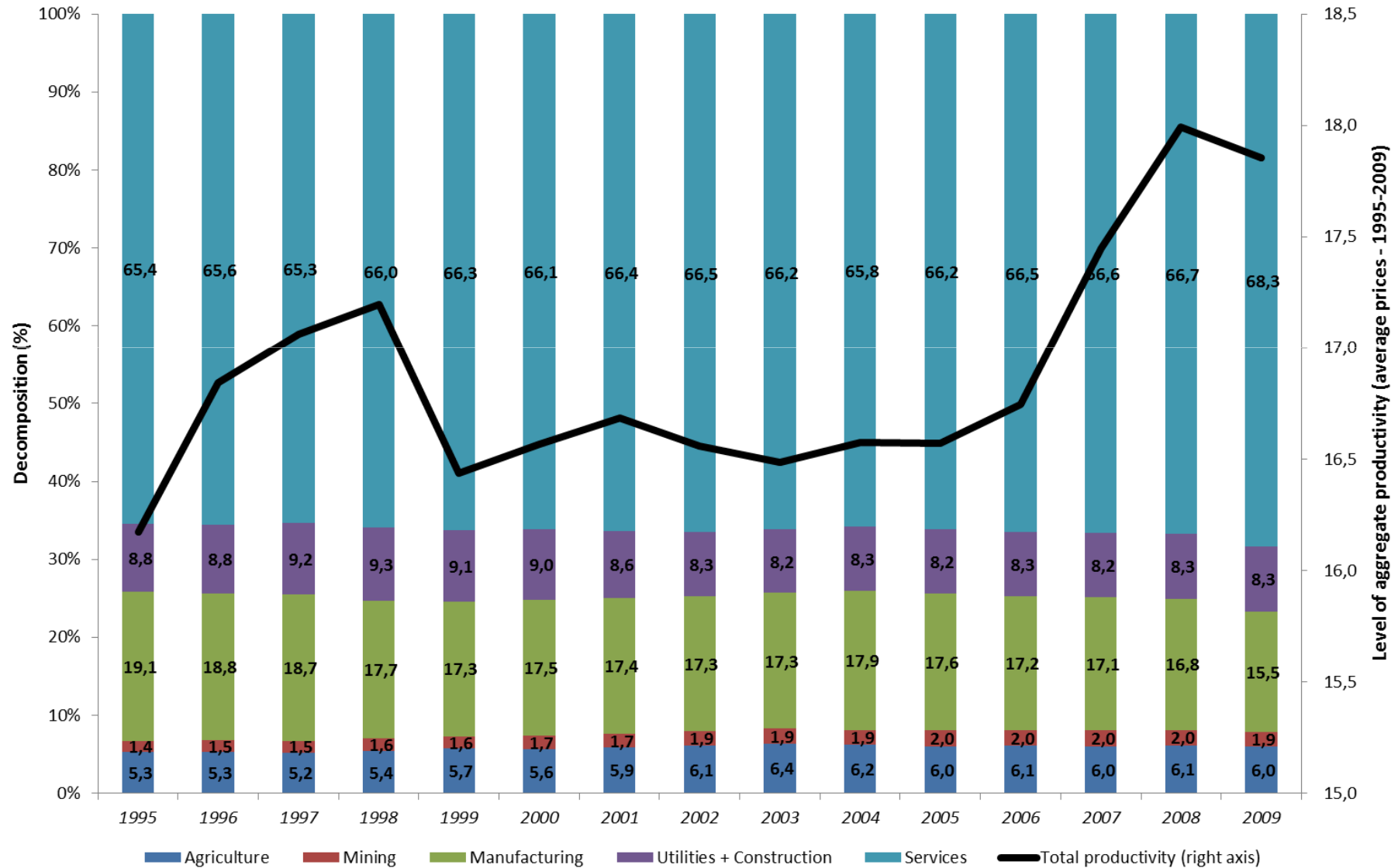
Labour productivity - Total

In thousand R\$ – average prices – 1995-2009



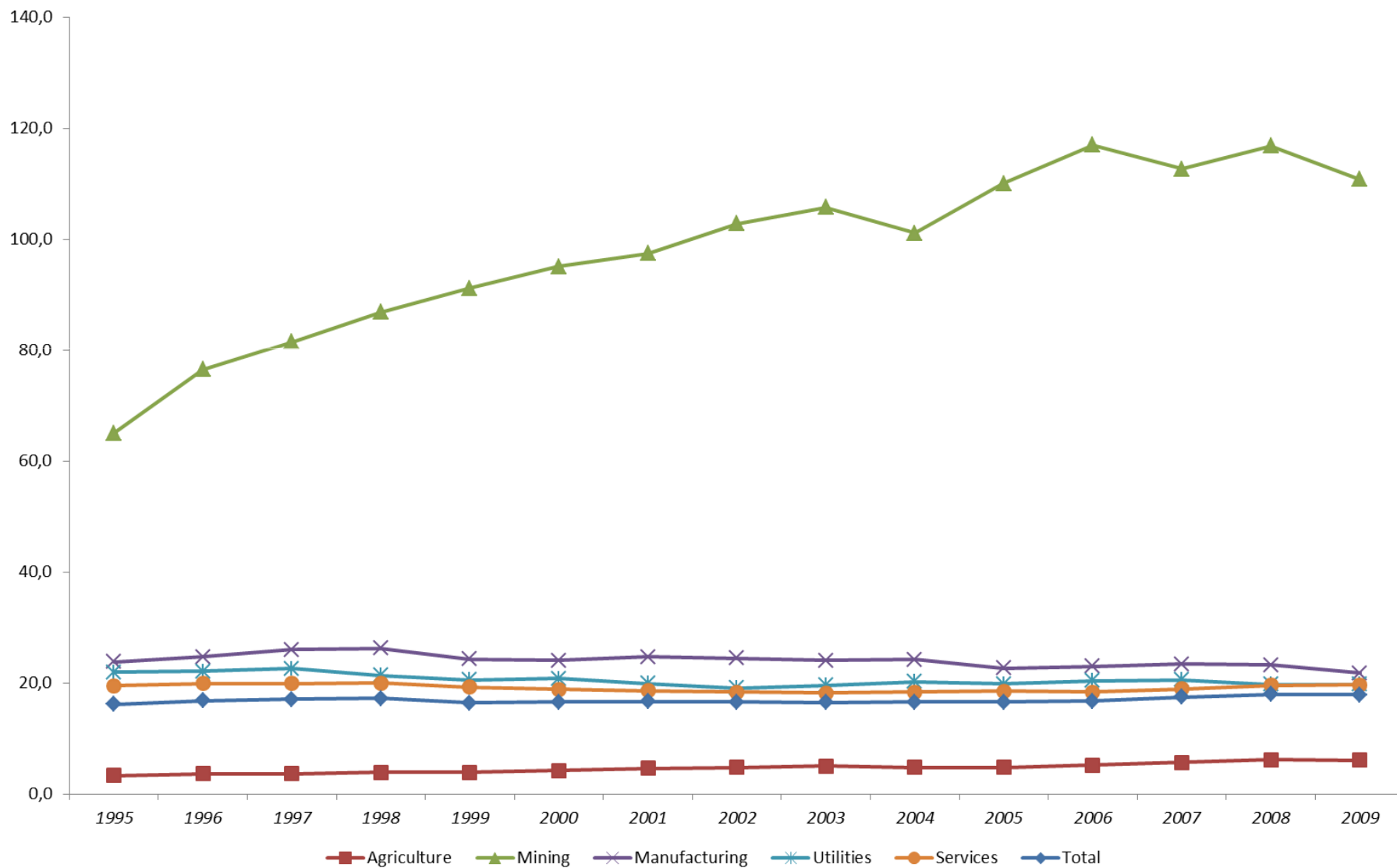
Labour productivity – Decomposition

Sectors weighted by employment shares – 1995-2009



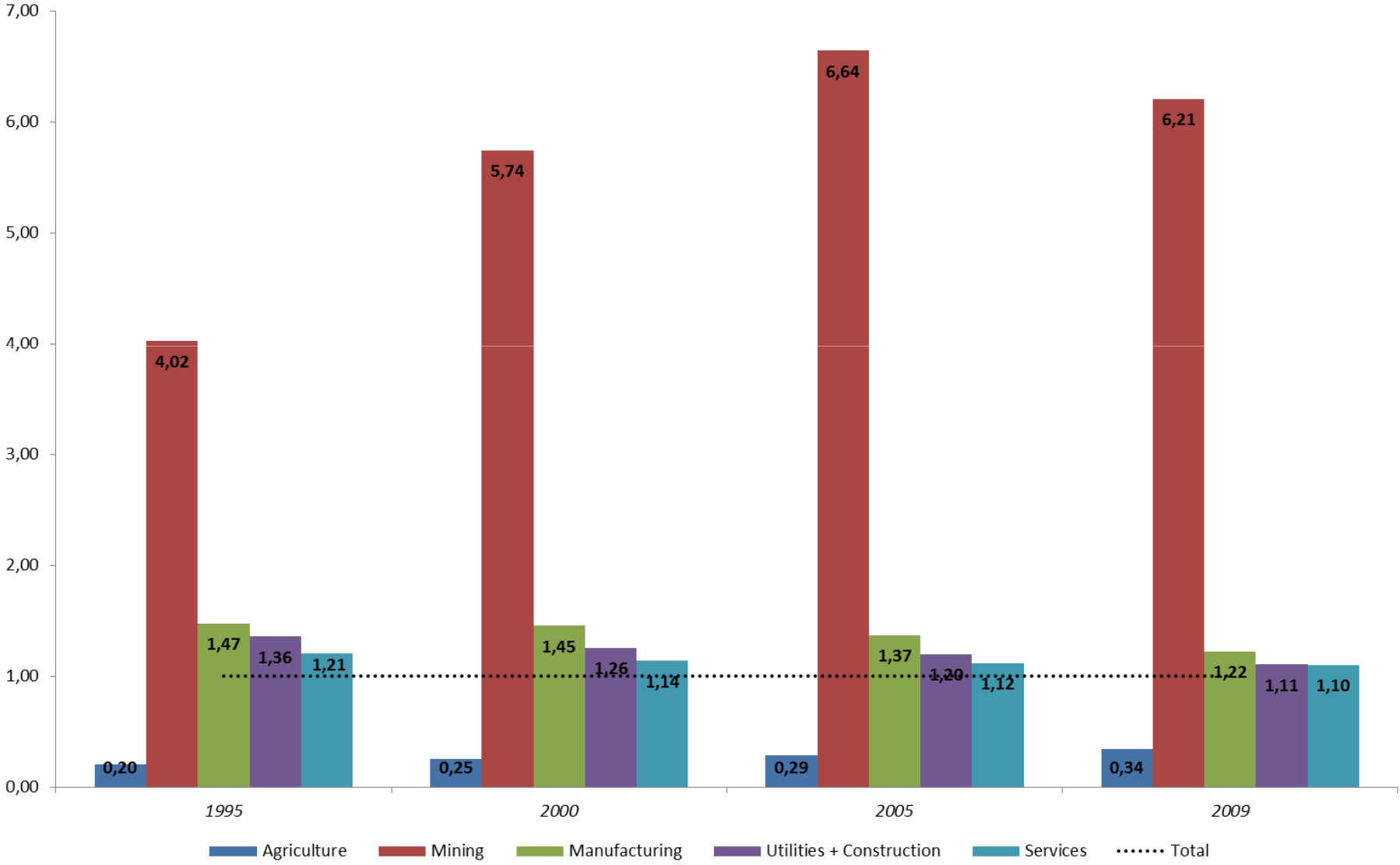
Labour productivity – Total and Sectors

In thousand R\$ – average prices – 1995-2009



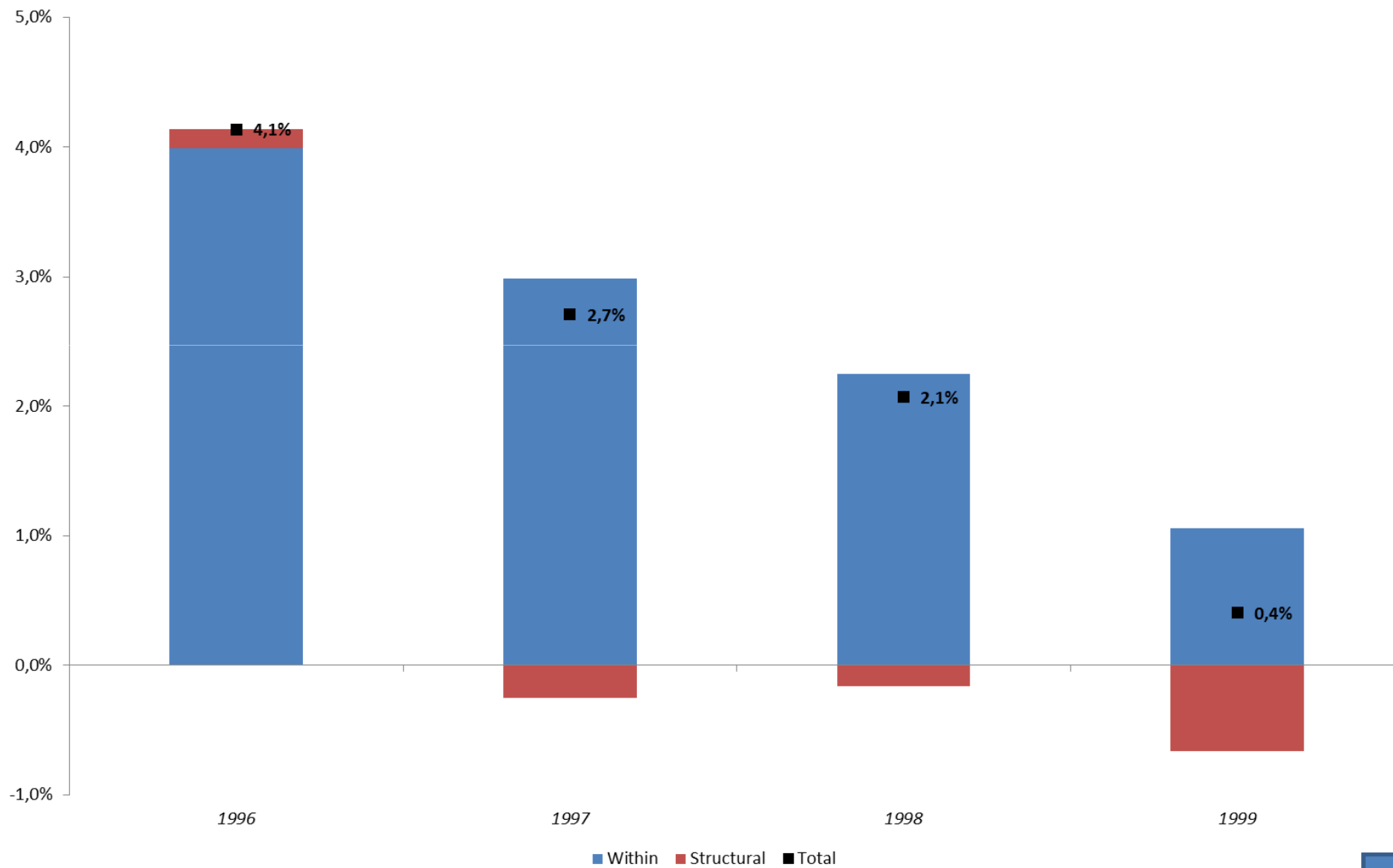
Labour productivity – Structural Heterogeneity

Productivity ratios (sectoral over total) – 1995-2009



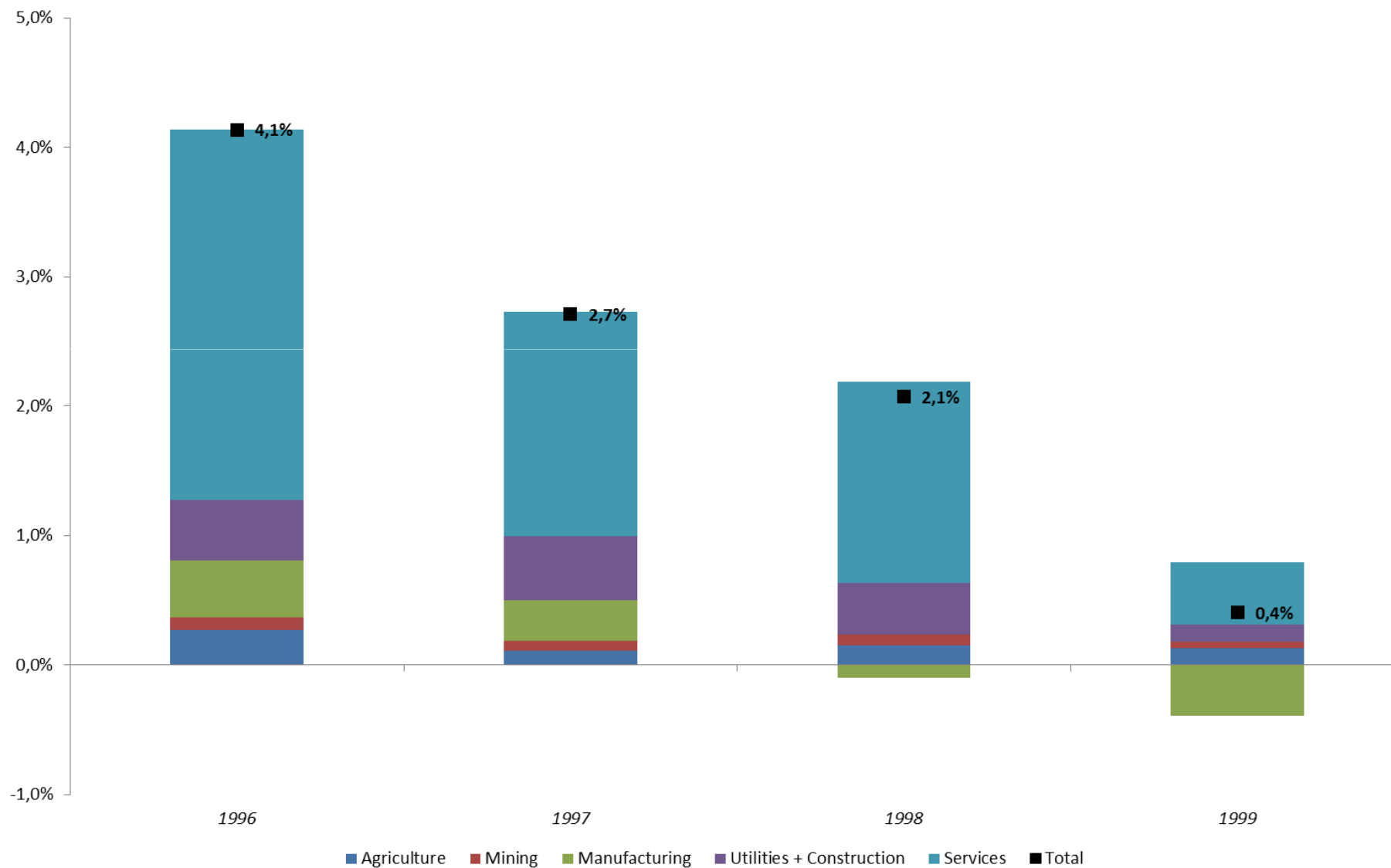
Labour productivity – Decompositon – Base year 1995

Shift-share – Total – Compound annual rate (%) – 1995-1999



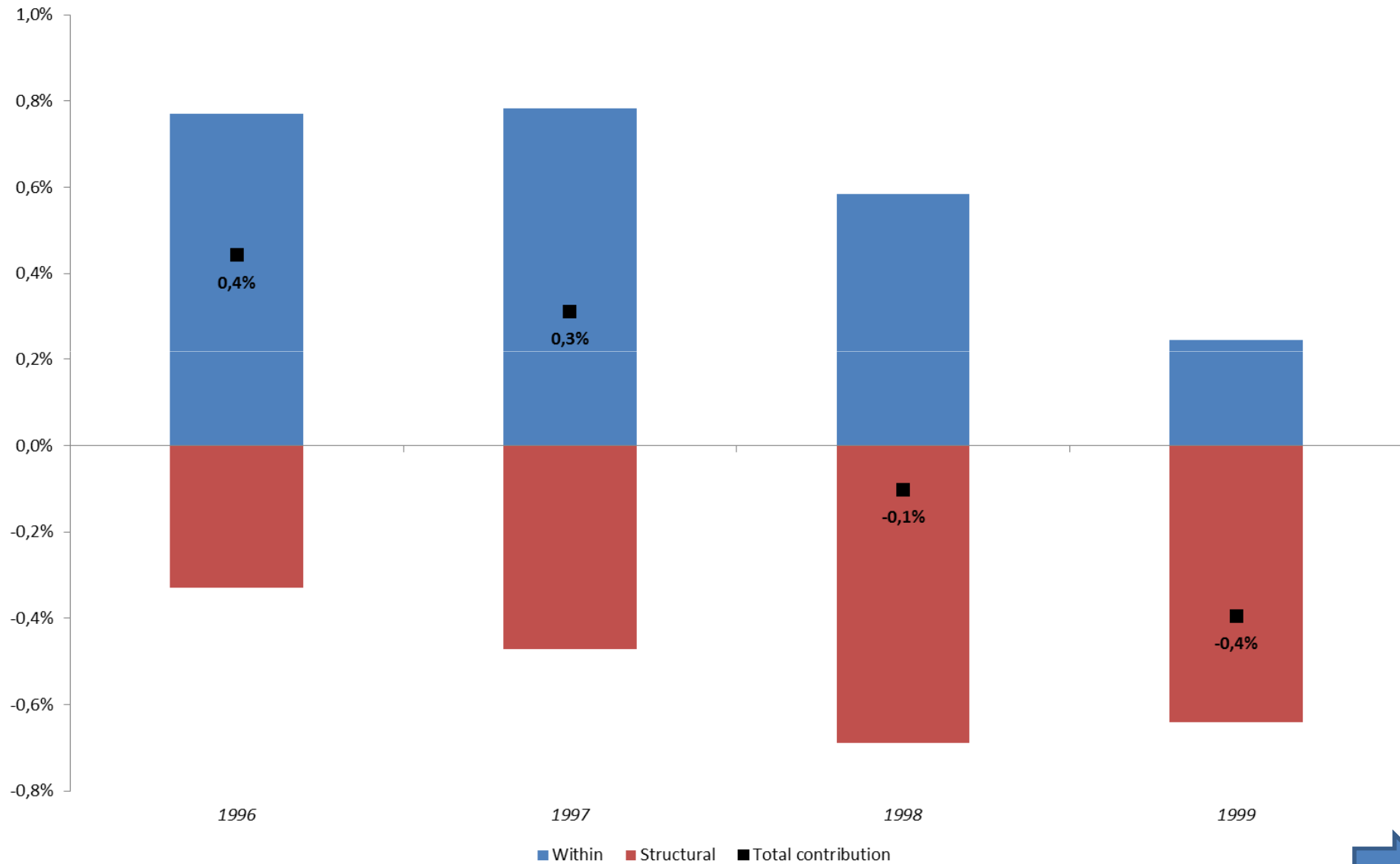
Labour productivity – Decompositon – Base year 1995

Shift-share – Sectors – Compound annual rate (%) – 1996-1999



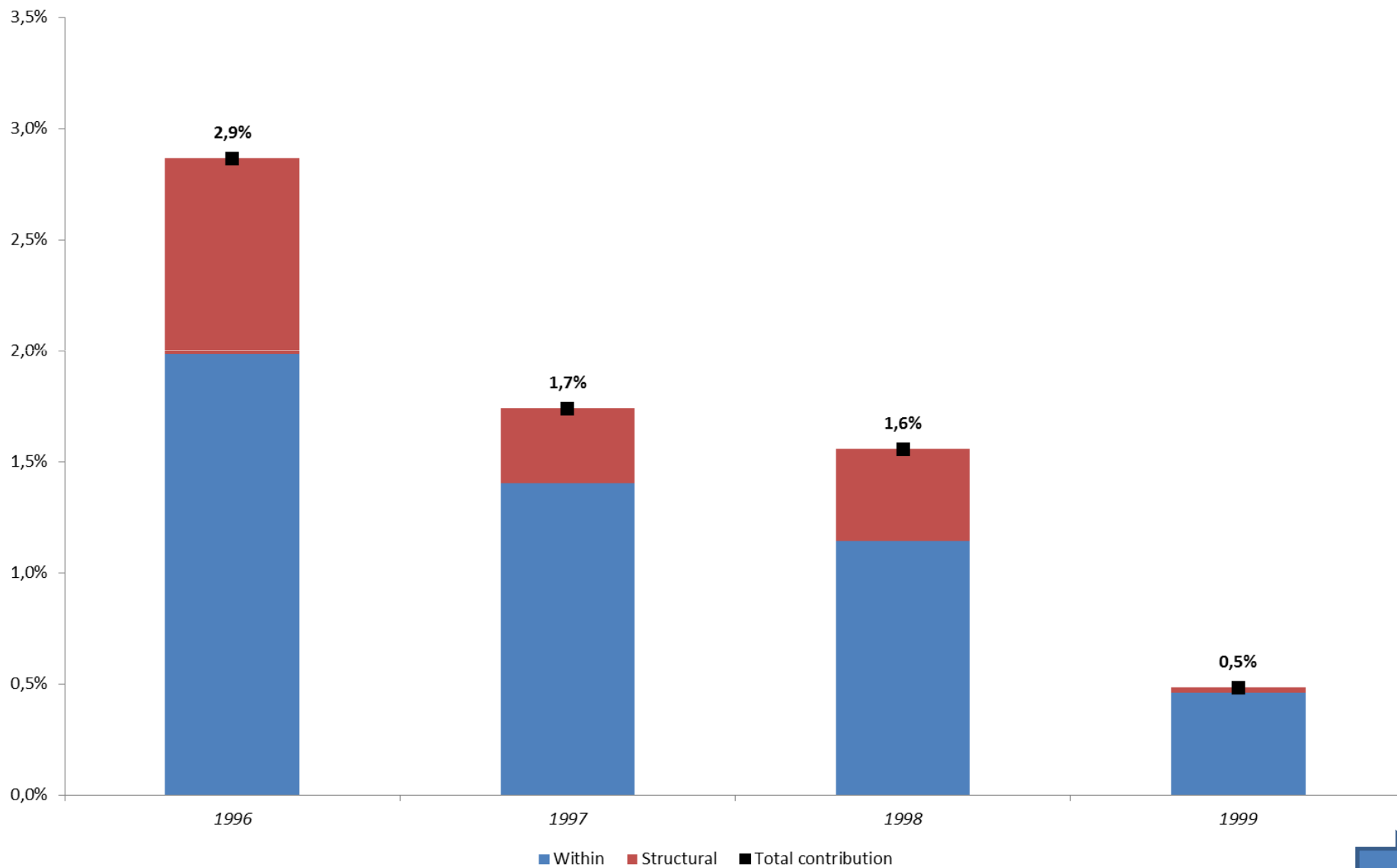
Labour productivity – Decompositon – Base year 1995

Shift-share – Manufacturing – Compound annual rate (%) – 1996-1999



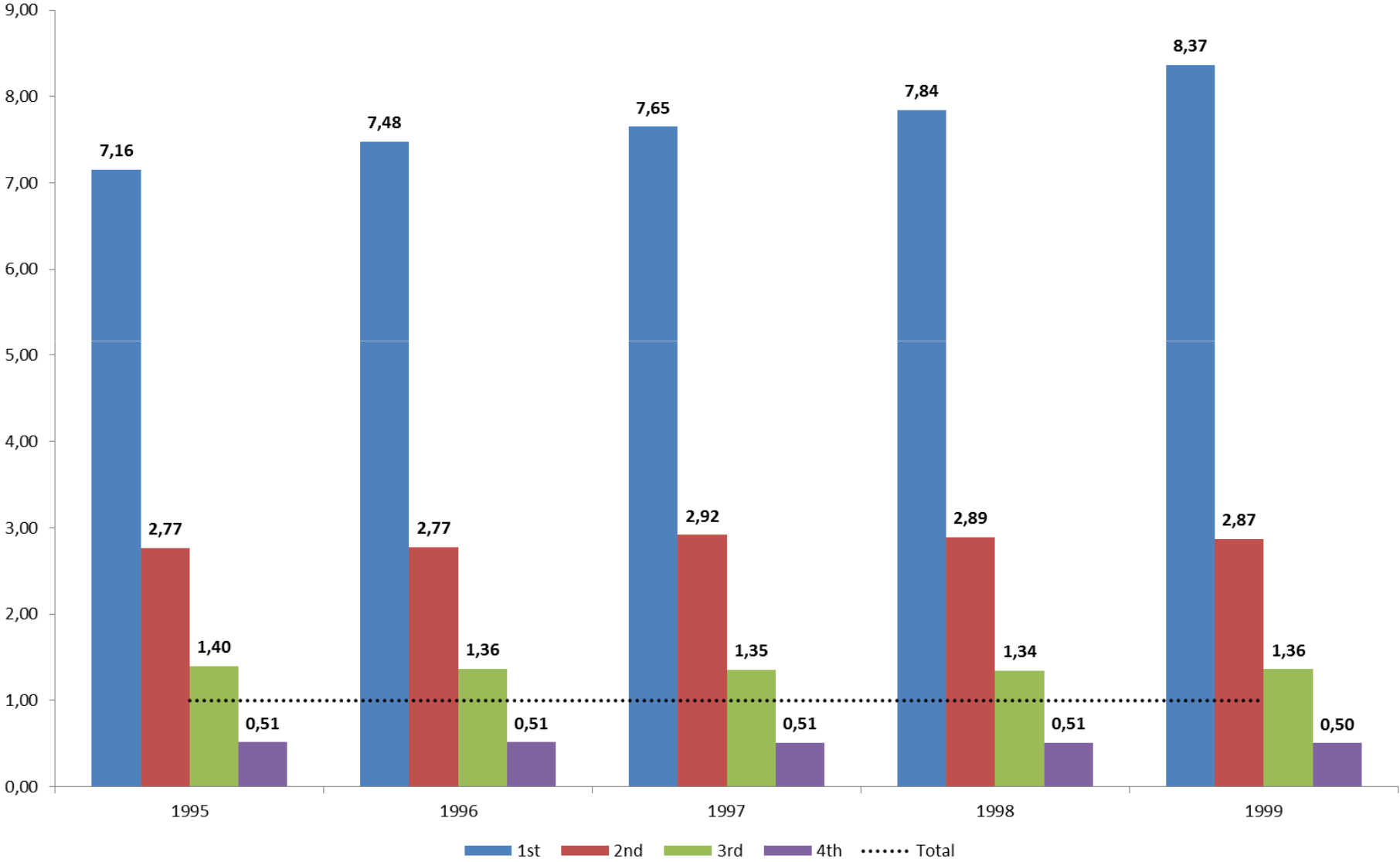
Labour productivity – Decompositon – Base year 1995

Shift-share – Services – Compound annual rate (%) – 1996-1999



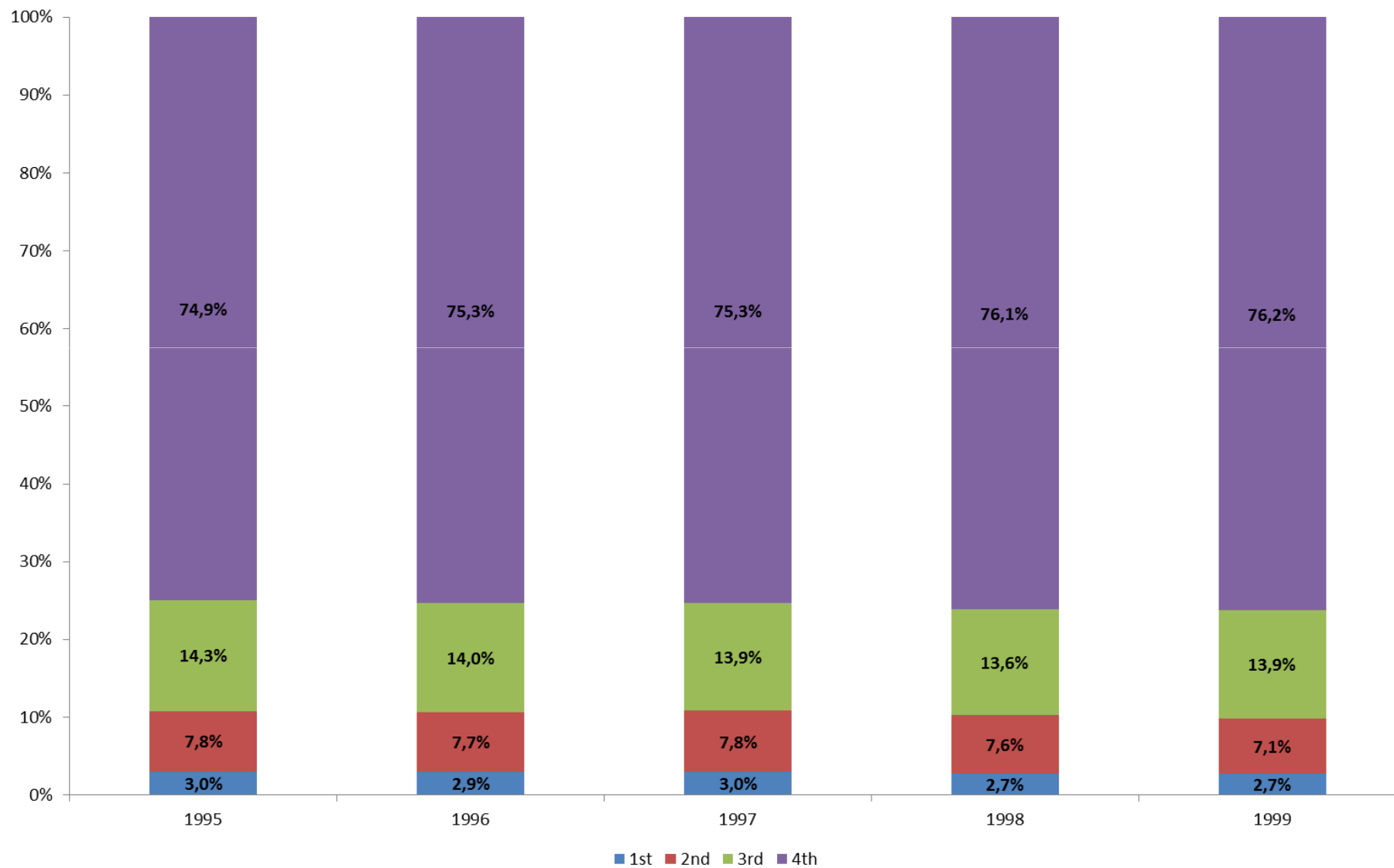
Labour productivity – Structural Heterogeneity

Productivity ratios (quartiles over total) – 1995-1999



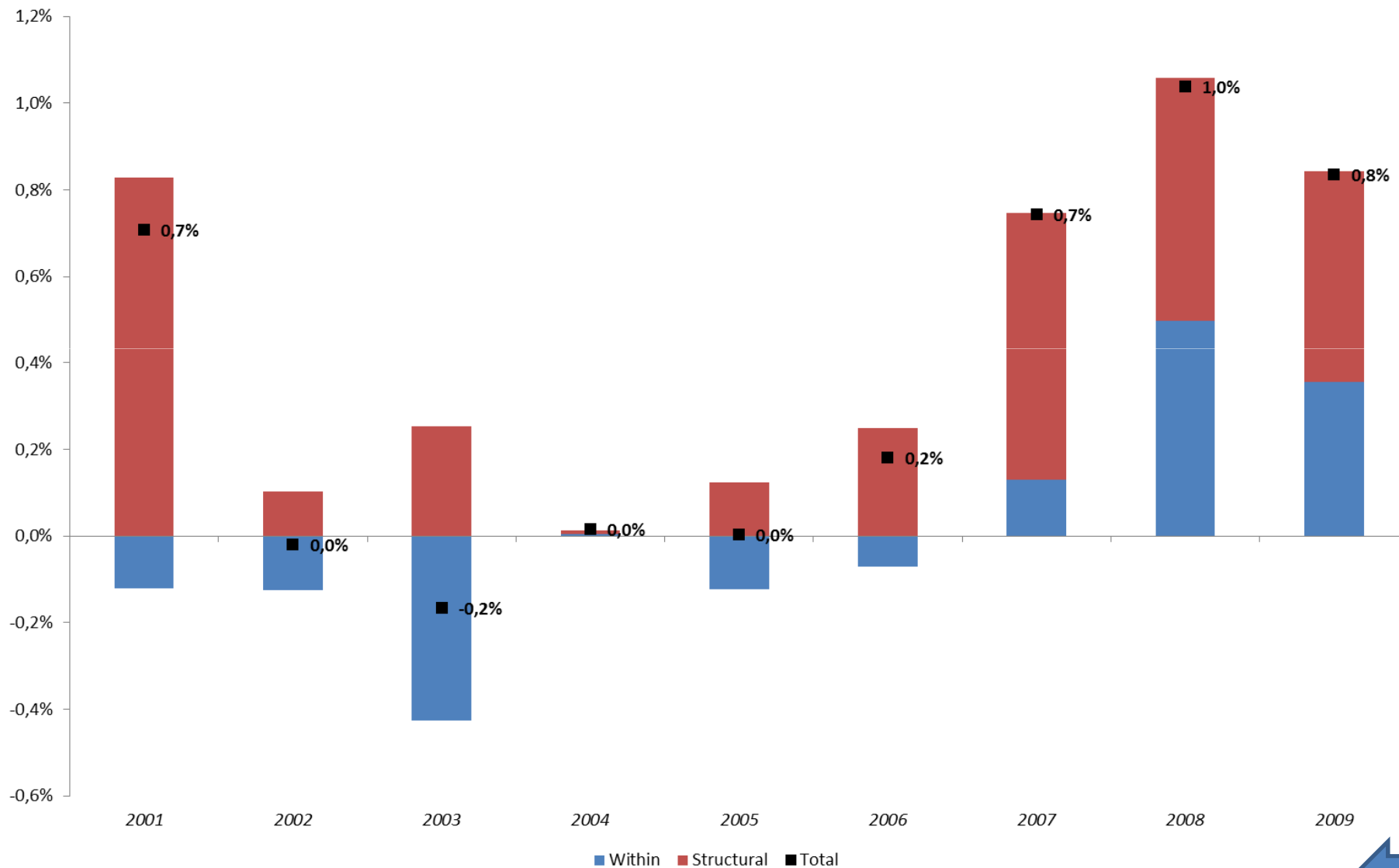
Labour productivity – Structural Heterogeneity

Decomposition weighted by employment shares (quartiles) – 1995-1999



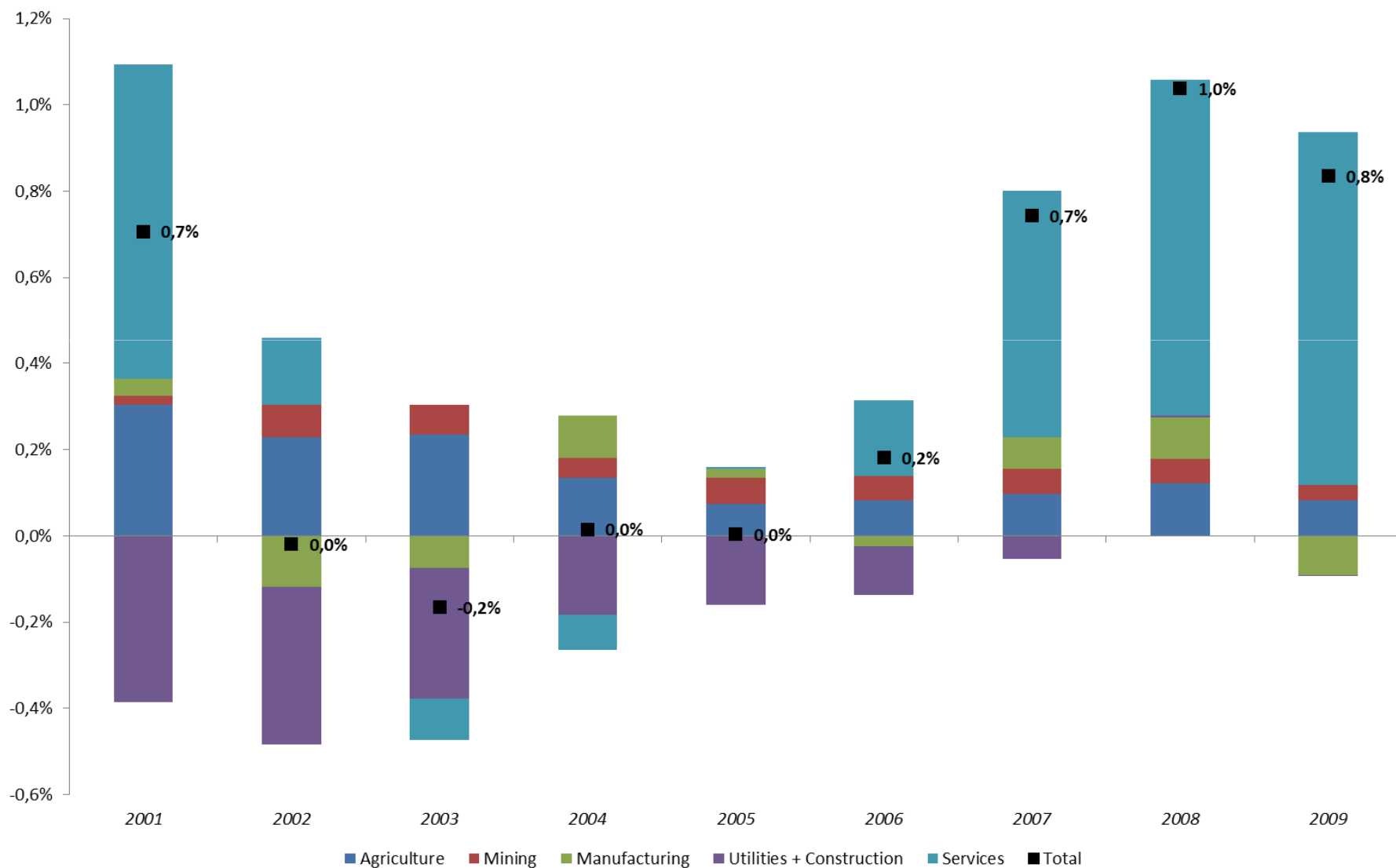
Labour productivity – Decompositon – Base year 2000

Shift-share – Total – Compound annual rate (%) – 2001-2009



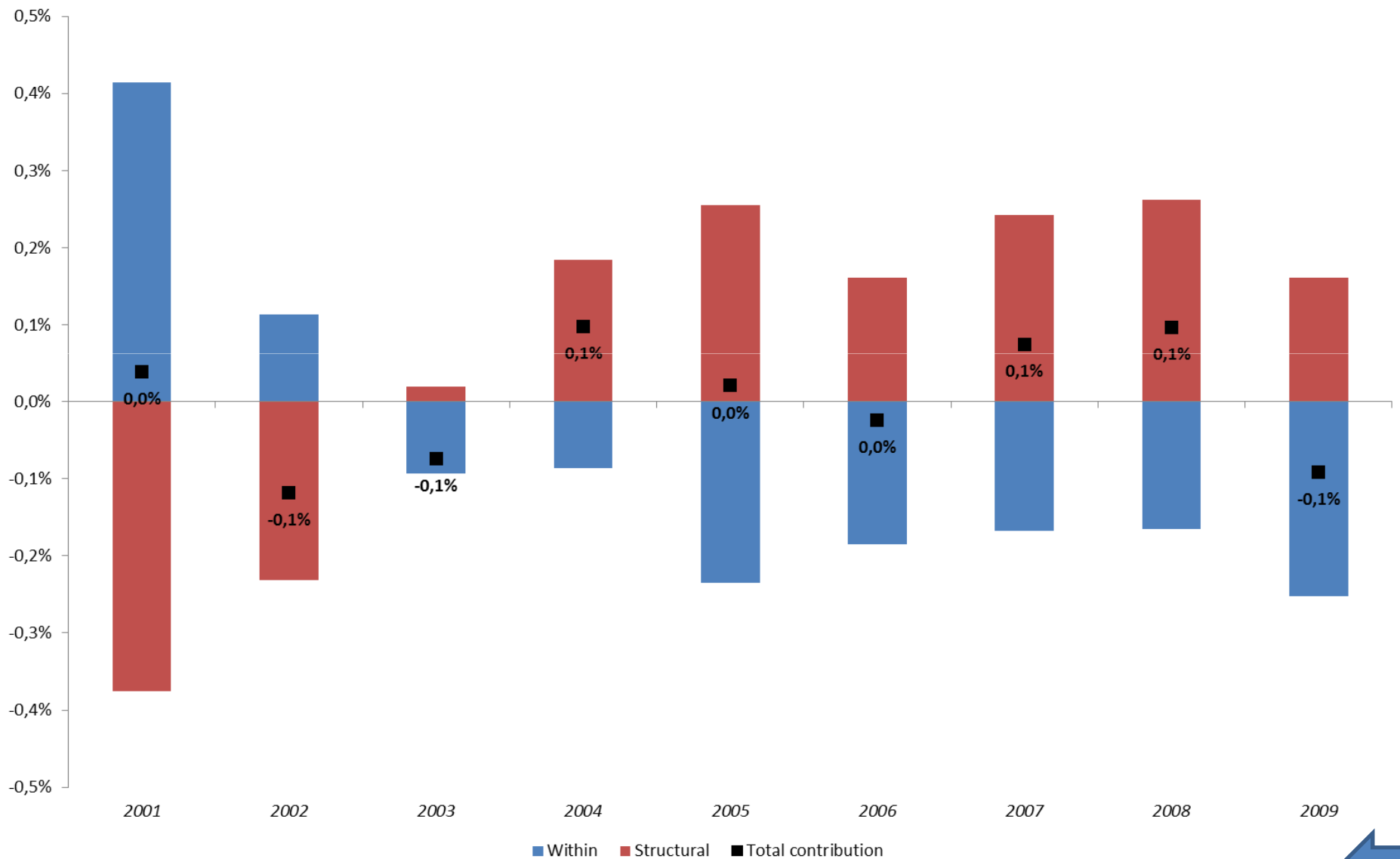
Labour productivity – Decompositon – Base year 2000

Shift-share – Sectors – Compound annual rate (%) – 2001-2009



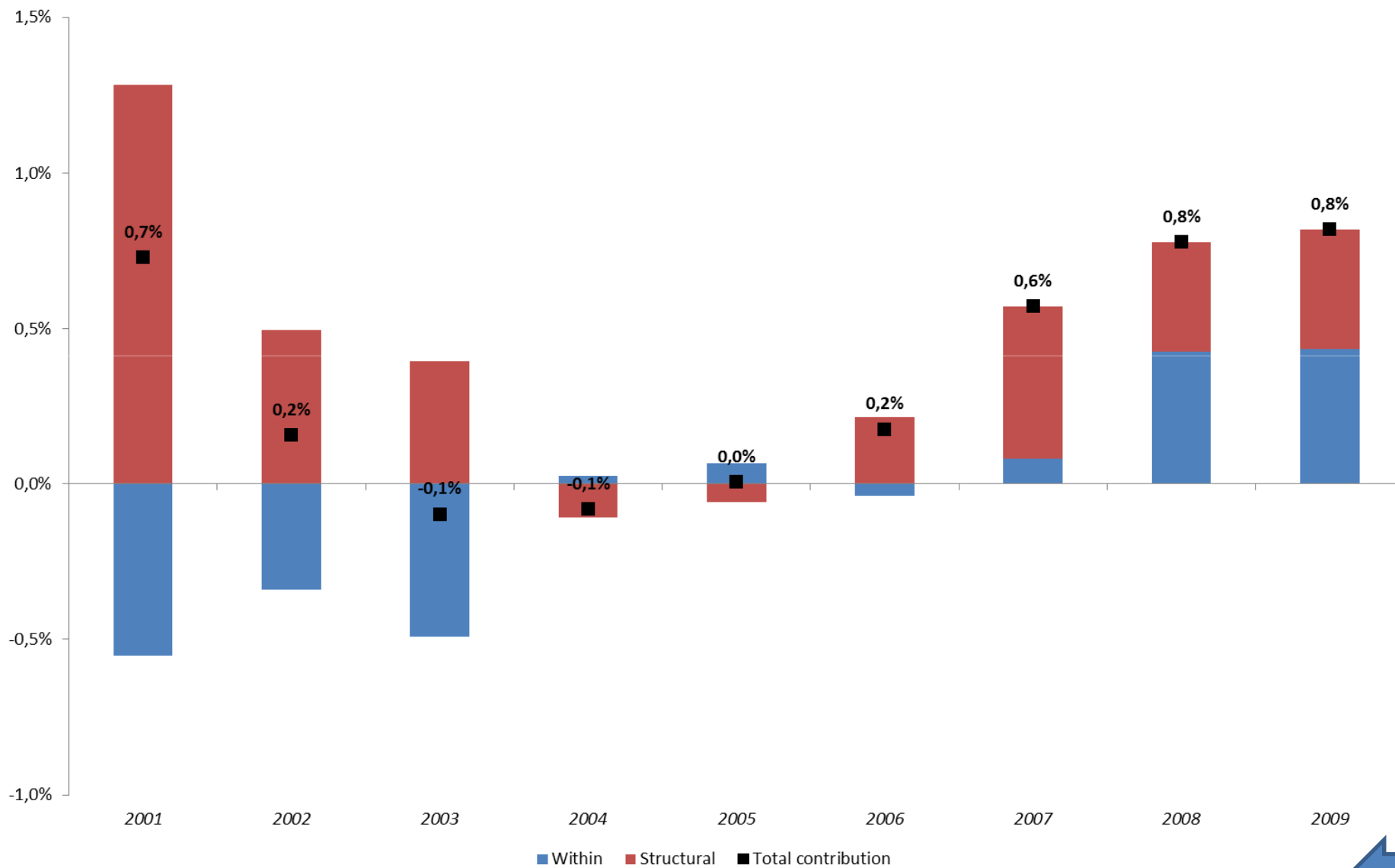
Labour productivity – Decompositon – Base year 2000

Shift-share – Manufacturing – Compound annual rate (%) – 2001-2009



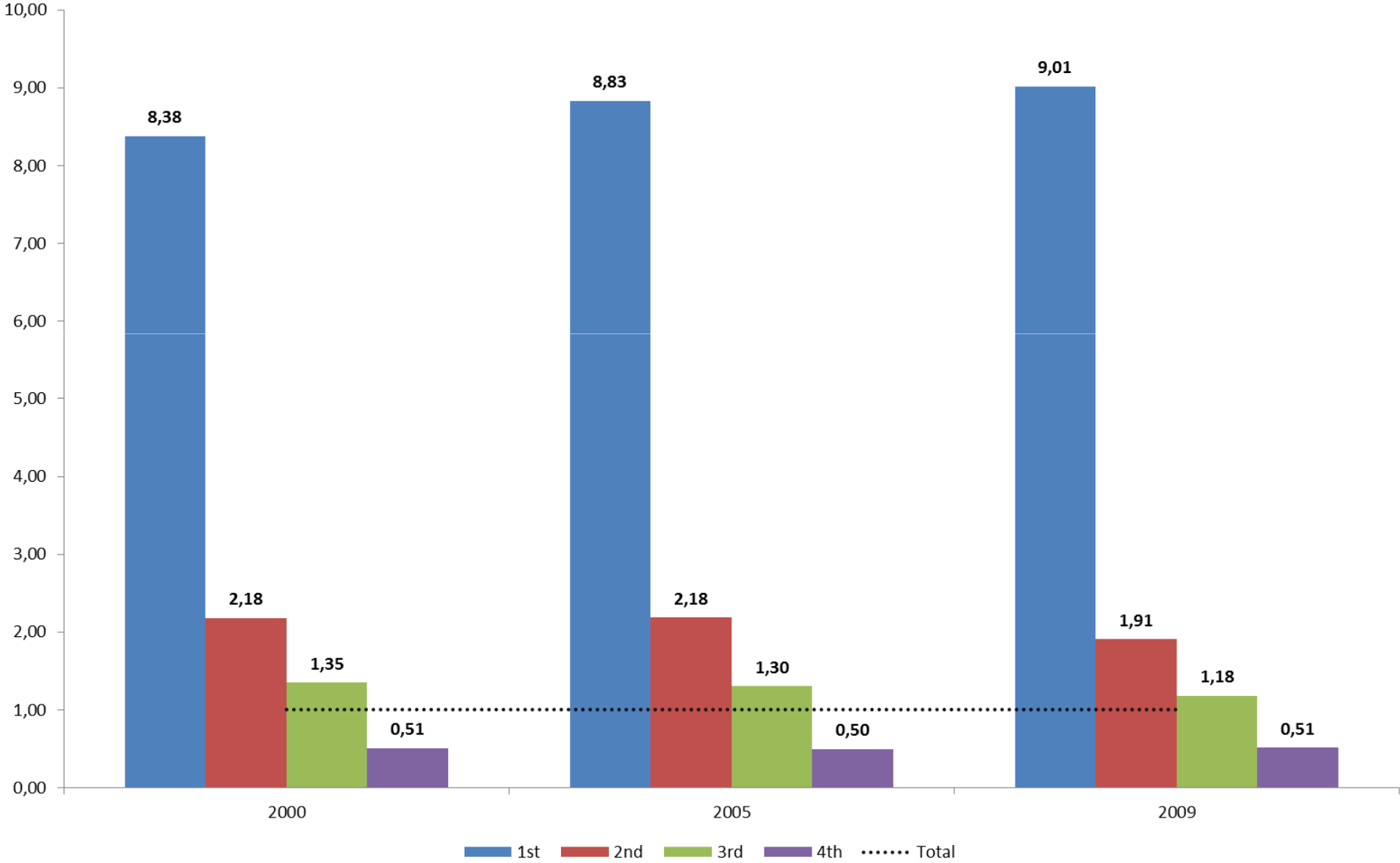
Labour productivity – Decompositon – Base year 2000

Shift-share – Services – Compound annual rate (%) – 2001-2009



Labour productivity – Structural Heterogeneity

Productivity ratios (quartiles over total) – 2000-2009



Labour productivity – Structural Heterogeneity

Decomposition weighted by employment shares (quartiles) – 2000 / 2005 / 2009

