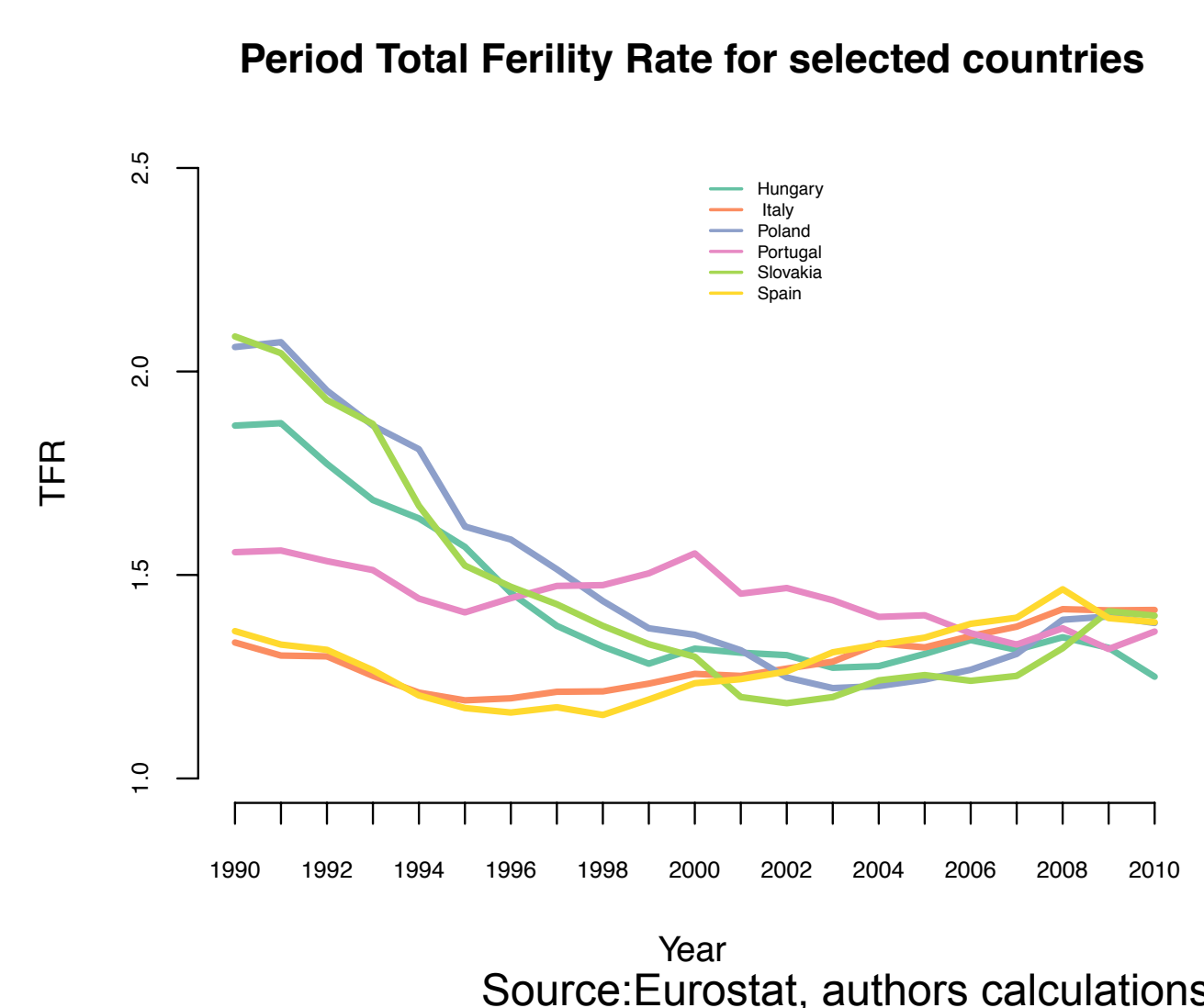# Portugal: South or East European Country?

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Background & Context

o **Portugal**, **Poland**, **Hungary** and **Slovakia** were in 2009 the only European countries which **don't present recuperations** in **the cohort fertility**.

o **Spain** and **Italy** had in the recent past some of the **lowest-low** values in the **period fertility**.

o If we establish a comparison between fertility levels in 2000-2005 and 2006-2010, **Portugal** is the only country in the European context that presented **negative evolution of period fertility**.

o **Portugal** was until **1999** the **only Southern European** country **with relatively high fertility** and considerable **lower unemployment** (Kohler et al. 2005)

o We can observe **2 patterns** one from the **South** (Italy and Spain) and one from the **East** (Poland, Hungary and Slovakia), although the differences were less accentuated in the last decade.

o And **Portugal** were can we situate the country? Does Portugal fits in on of this patterns or have a specific one?

o What are the causes for the **differences between Portugal** and the **South** European **neighbours**?

o And the **similarities between Portugal** and the **East** European **"distant"** countries?

Period Total Ferility Rate for selected countries

Source:Eurostat, authors calculations

Methods

① With the objective of contextualize Portuguese fertility and understand if period fertility behaviour/context are similar to South or to the Eastern European Countries, we used the Tempo & Quantum adjustments:
  ➢ Proposed by Bongaarts and Feeney (1998) – TFR';
  ➢ Corrected by Sobotka (2004) – TFR*;
  ➢ Corrected the second time by Goldstein et al. (2009) – TFR**;

② With the objective to predict if the economy, social and cultural context have bigger impact in South or in East Europe it was created linear regression models based on:
  ➢ the Gross Domestic Product (GDP ppp);
  ➢ The share of young adults between ages 18-34 living with parents;
  ➢ The female employment rates:
   ➢ ages 15-24,
    ➢ ages 25-54 .

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Results – Tempo & Quantum adjustments

In the case of Portuguese TFR adjustments, we can´t observe significant differences; in the last years the gap between the adjusted models and the empirical values diminishes.

Adjusted TFRs for Portugal

Adjusted TFRs for Hungary
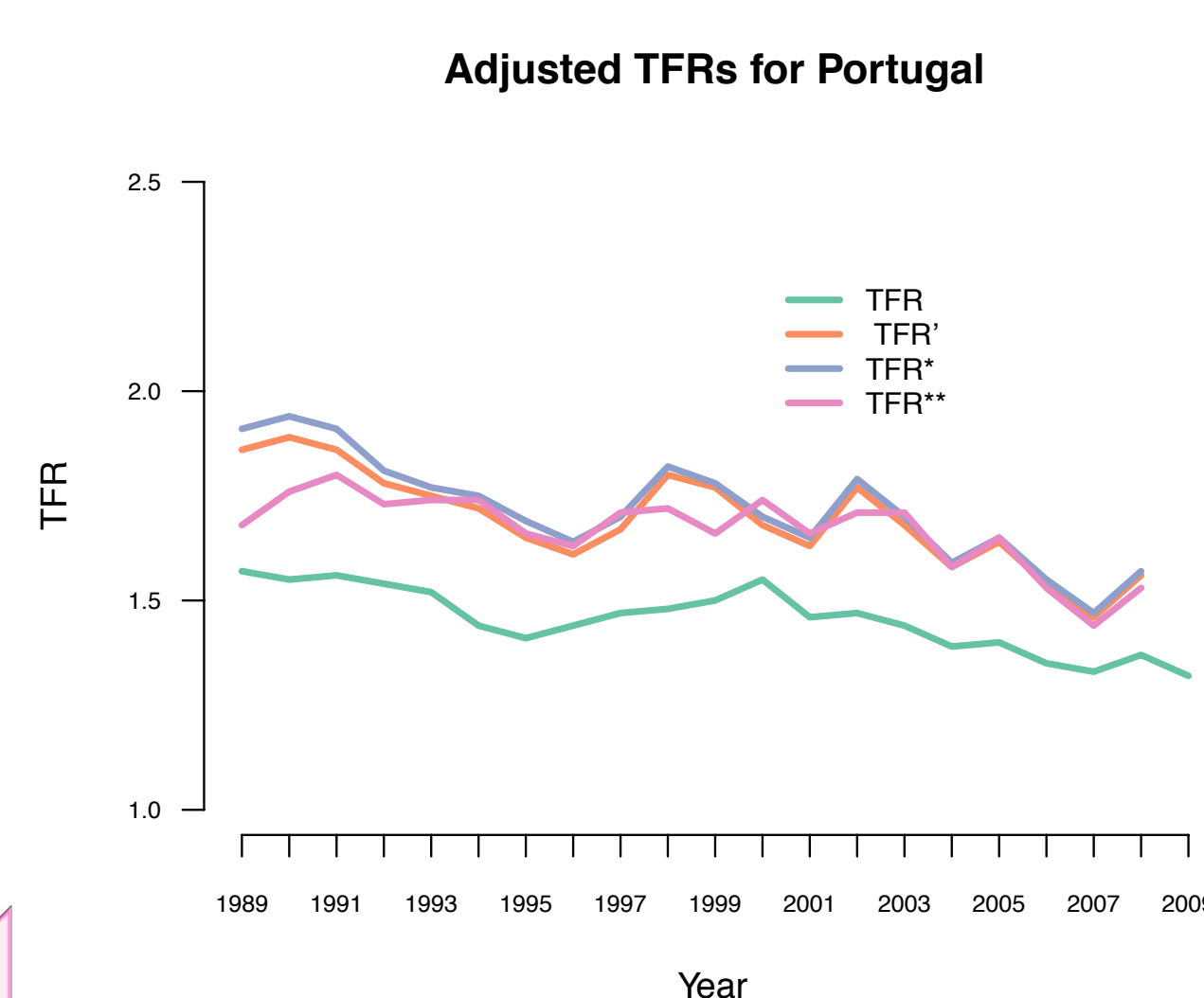
For the case of Hungary, the TFR adjusted values are relatively higher when compared to the original TFR.

In this case the we can observe in the last years a decline in the adjusted values, which is not so verifiable in the TFR.
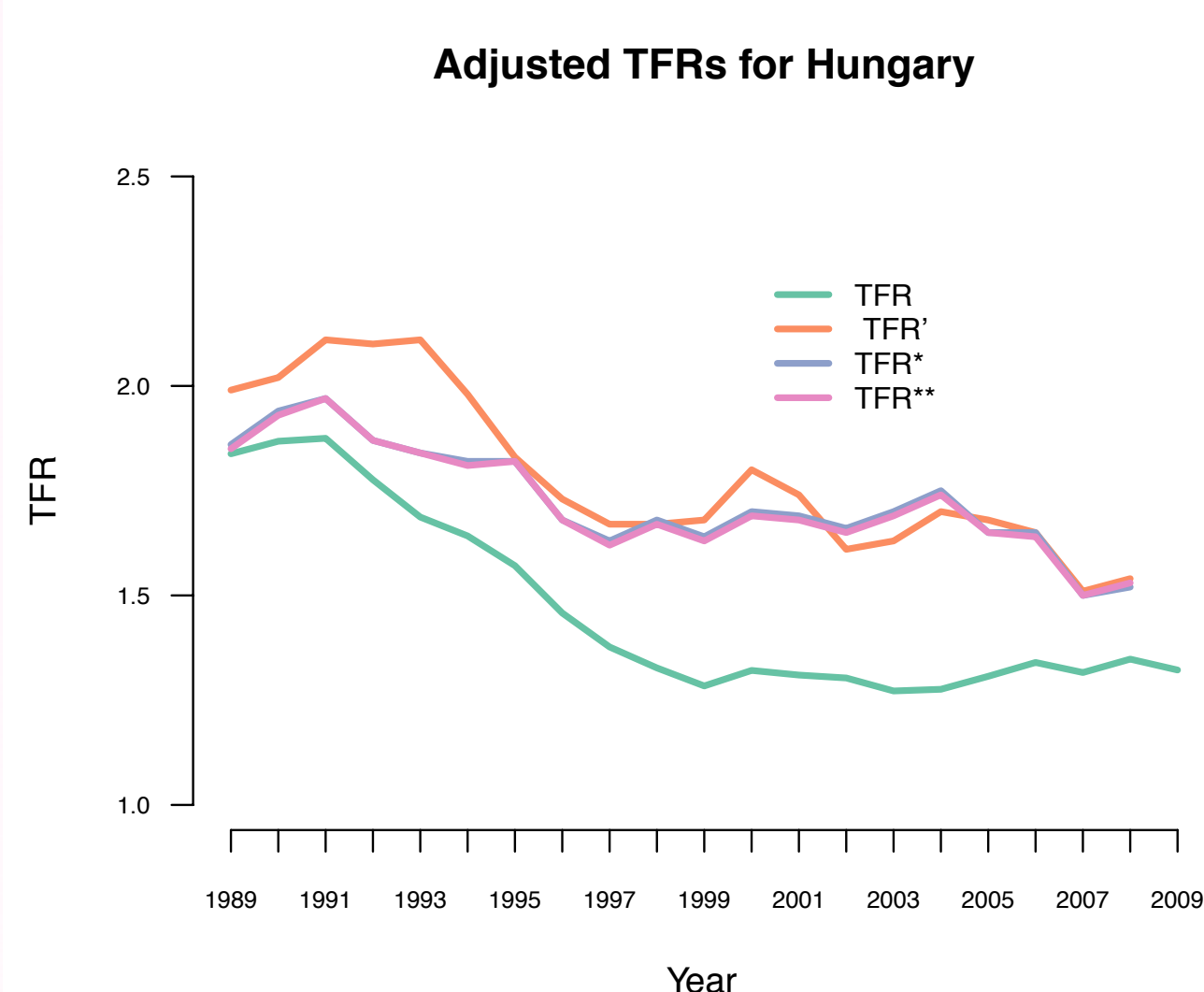
Results – Linear Regression Models

For the different countries in analysis the:
o **R²** for **all** the **final models** presented **values higher** than **90%**,
o The **employment rate** between **ages 25 and 54** is **common to all** the **final models**, with **exception to Italy**;
o The **GDP** do **not presents statistical significance at any model**;
o **Slovakia** is the **only country** to which **any** of the **variables assume statistical significance** when the **dependent variable** is the **TFR**;
o In opposition when we assume **MAC as** the **dependent variable**, Slovakia is the **only country** with **significant results**.

Linear Regression Models - Examples

The final model to Spain assuming the TFR as dependent variable explain approximately 99% of the decline in the period fertility, and this value is explained by the female employment rates and by the year.

For the case of Spain we can observe, e.g. that:
  o with the increase of employment rates in ages 15 to 24 decline the fertility levels and,
  o when the employment rates increases at older ages the fertility levels have a positive response.

Table 1: Final Model to Spain (TFR as dependent variable)

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	43.861659	16.040437	2.734	0.02103*
Emp_Rate_15_24_Females	-0.011481	0.003470	-3.309	0.00790**
Emp_Rate_25_54_Females	0.027869	0.005846	4.767	0.00076***
year	-0.021872	0.008124	-2.692	0.02262*

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Adjusted R-squared: 0.9898

Source:PORDATA and Eusotat, authors calculations

Assuming the Mean age at childbirth (MAC) as dependent variable, the final model to Slovakia the GDP and the female employment rate between ages 15 and 24 are the significant variables which influences on the postponement of fertility.

Table 2: Final Model to Slovakia (MAC as dependent variable)

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	2.684e+01	5.262e-01	51.000	2.42e-11 ***
GDP	1.677e-04	1.655e-05	10.135	7.68e-06 ***
Emp_Rate_15_24_Females	-6.518e-02	1.316e-02	-4.952	0.00112 **

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Adjusted R-squared: 0.992

Source:PORDATA and Eusotat, authors calculations

Final Results

o The postponement and decreasing of period fertility is common to all the countries in the analysis;

o However in the most recent years Portugal and Hungary have a slightly distance from the other countries;

o The major difference between South and East Europe is in the ages of higher fertility levels that in the South are at older age groups and in the East at the youngest ages;

o The adjusted TFR's revels higher values of fertility, in particular values higher than 1.5 children per woman, in the different countries;

o Spain is the country that presents a major impact of female labour participation in the postponement of fertility;

o Hungary is the only country were the female employment rates are statistical significant at later ages;

o To Slovakia any of the variables was able to explain the decline of fertility, and to Italy only the year was statistically relevant;

o However in the postponement perspective Slovakia is the only countries to which the variables provides a good statistical explanations of the behaviour.

In the context of the presented results Portugal seems to continue to be in between the two European regions, it presents similitudes with the neighbours from the south but also revels some characteristics similar to the East.
To better understand the Portuguese and European behaviour in this area, also the education factors and other social factors need to be take into consideration.

If Portugal is postponing and declining period fertility and at the same time is since the 60's one of the European countries with higher female participation in the labour market, what changed in the last decades?

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