

The Effect of the Global Financial Crisis on OECD Potential Output

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Outline

- Introduction
- Objectives
- Key Findings
- Methodology
- Empirical Results

Introduction

Effects of Financial Crisis:

- Increase government deficit, debt experience
- Capacity constraints

Benefits of this analysis:

To understand the impacts of financial crisis on two aspects;

1. Overall OECD and Each country
2. Each components of Potential output

Objectives

Question

- What is the level of outputs loss after OECD economy got hit by 2008 Financial crisis in medium-term periods (Bankruptcy of Lehman Brothers) ?

Key Findings

By Countries

- Overall median loss in potential output in 2014
 - 19 OECD countries = $3\frac{3}{4}$ per cent
 - All OECD countries = $2\frac{3}{4}$ per cent
- Smaller European countries face reduction in potential out put more than 10%, in contrast with Germany and Japan

Key Findings

By Components of Potential Output

- Main factor effecting potential output is "Lower Productivity"

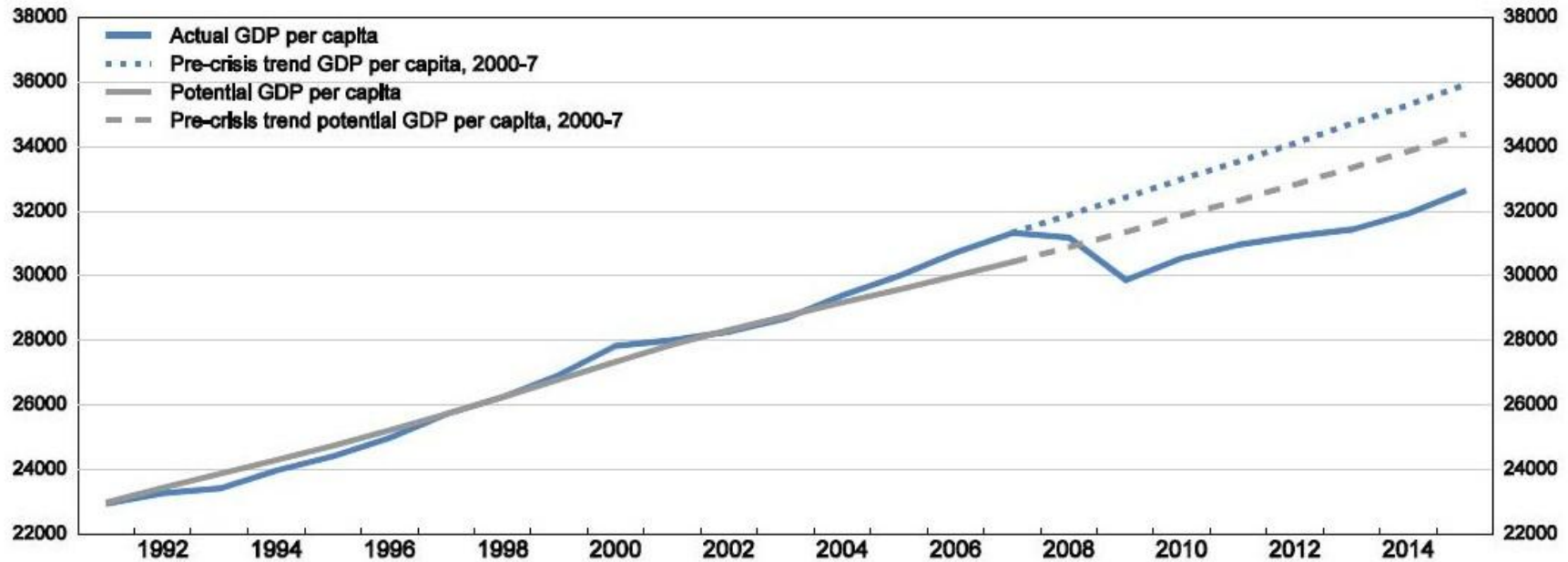
Productivity = Total Factor Productivity + Lower Capital per worker

- Lower Potential employment and Moderate Labor Force participant (less severe)
 - (-) Higher structural unemployment
 - (+) Pension reforms
 - (+) Net migration flows (Europe)
 - (+) Demographic effects (USA)

Evaluation Idea

Figure 1. OECD GDP per capita compared to various pre-crisis trends

In 2005 PPP US dollars



Note: OECD GDP per capita over the period 2014-15 is based on May 2014 *OECD Economic Outlook* projections.

Source: OECD calculations based on *OECD Economic Outlook*, May 2014 long-term database.

Methodology

Find: Medium-term output loss after Financial crisis by deriving “counter-factual post-crisis trajectory for potential output per capita”

Assume: Cobb-Douglas production function

1) Potential output function:

$$(1) \quad y^* = \alpha (n^* + e^*) + (1 - \alpha) k,$$

where lower case letters denote logs and α is the wage share.

Where; Y^* = Potential output

N^* = Potential employment

K = Capital stock ; $K_t = K_{t-1}(1 - r_t) + I_t$,

E^* = Labor augmenting technical progress (trend labor efficiency)

Methodology

2)* Potential output per Head of Population :

$$(2) \quad \Delta(y^* - p) = \Delta(y^* - n^*) + \Delta(n^* - p).$$

Where; Y* = Potential output
P = Population
N* = Potential employment

Methodology

3) Trend Productivity Function :

$$(3) \quad \Delta(y^* - n^*) = \alpha \Delta e^* + (1 - \alpha) \Delta(k - n^*).$$

Where; Y^* = Potential output

N^* = Potential employment

K = Capital stock

E^* = Labor augmenting technical progress (trend labor efficiency)

α = The wage share

Methodology

4) Potential Employment Function :

$$(4) \quad \Delta(n^* - p) = \Delta(n^* - lf^*) + \Delta(lf^* - pwa) + \Delta(pwa - p),$$

Where; N^* = Potential employment ; $N^* = LFPR^* PWA (1 - NAIRU)$

P = Population

PWA = Population of working age (aged 15 to 74)

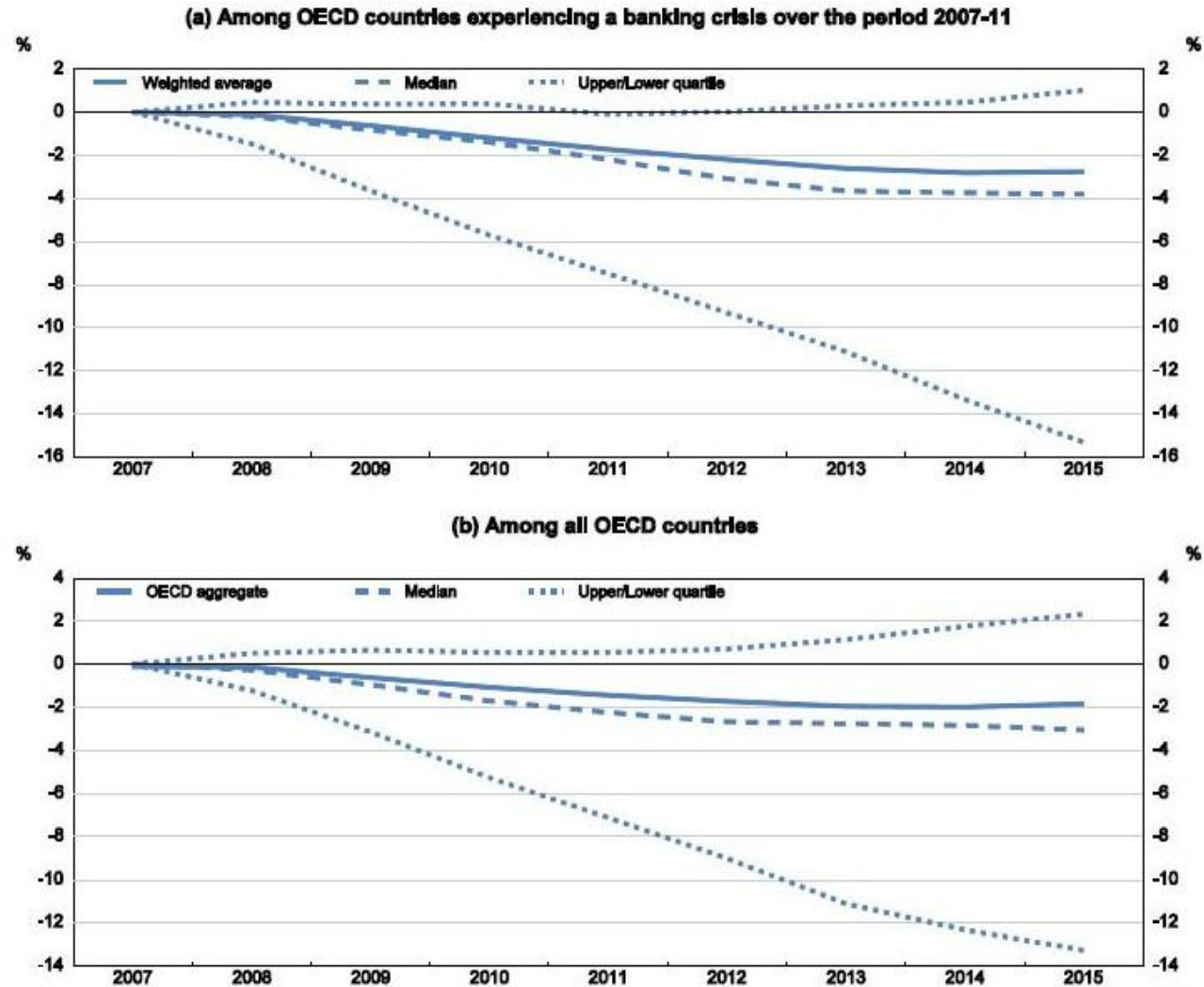
LF^* = Trend labor force

$LFPR^*$ = Trend labor force participation rate

$NAIRU$ = Structural unemployment rate

Empirical Results

Figure 2. Estimated effects of the crisis on the potential output of OECD countries
Percentage reduction in potential output relative to a pre-crisis counter-factual scenario



Note: Figure (a) only includes OECD countries judged to have experienced a banking crisis between 2007 and 2011 based on

Empirical Results

Table 1. Estimated effects of the crisis on the potential output of OECD countries in 2014

Percentage reduction relative to a pre-crisis counter-factual scenario

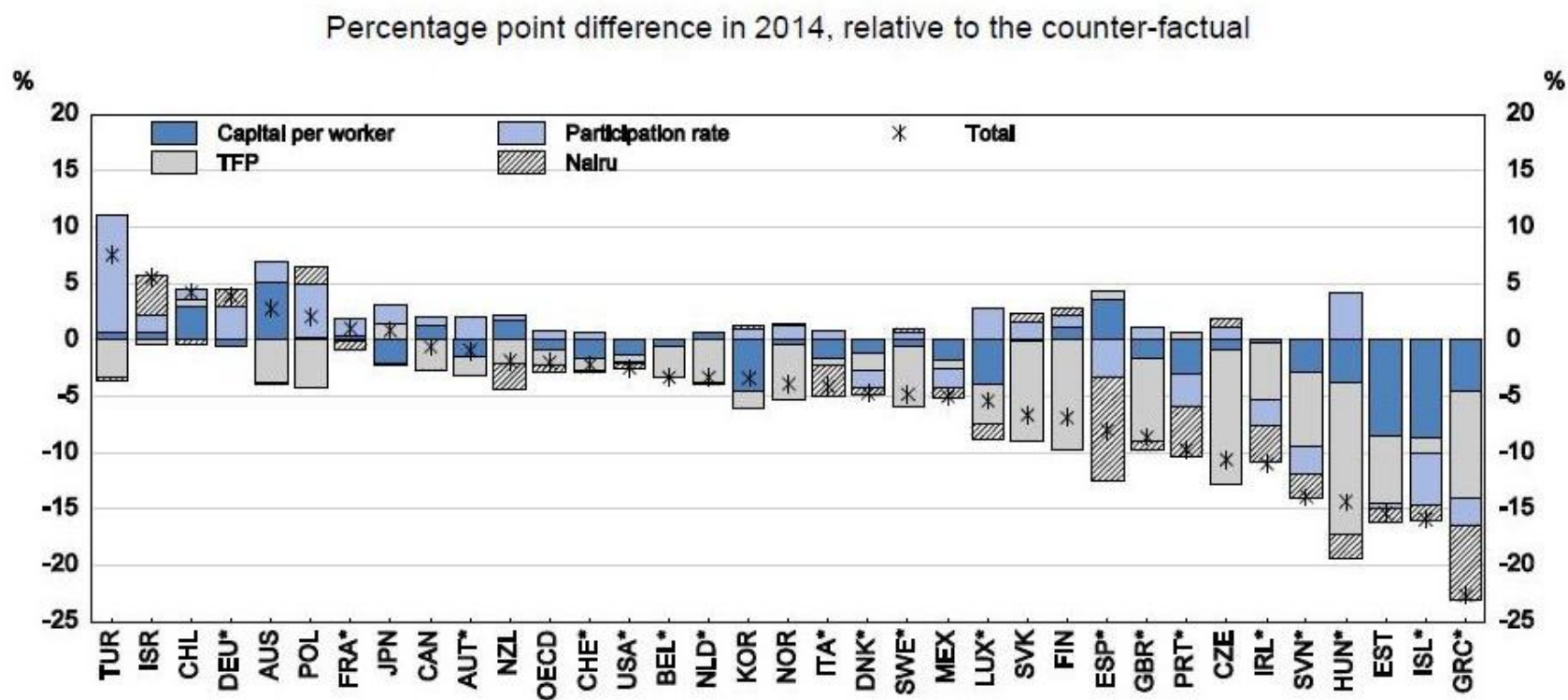
	TUR	ISR	CHL	DEU*	AUS	POL	FRA*	JPN	CAN	AUT*	NZL	OECD	CHE*	USA*	BEL*	NLD*	KOR
(1) Productivity	-2.6	0.4	3.7	-0.4	1.0	-4.1	0.2	-0.5	-1.3	-3.0	-0.1	-2.2	-2.7	-1.8	-3.4	-3.2	-4.7
(1a) Capital/worker	0.8	0.7	3.0	-0.5	5.0	0.2	0.3	-2.0	1.3	-1.5	1.8	-0.9	-1.6	-1.3	-0.5	0.6	-4.5
(1b) Total factor productivity	-3.4	-0.3	0.6	0.1	-3.8	-4.3	-0.2	1.5	-2.6	-1.5	-2.1	-1.3	-1.1	-0.5	-2.9	-3.8	-1.6
(2) Employment	10.2	5.1	0.6	4.3	1.8	6.2	0.9	1.4	0.7	2.1	-1.7	0.2	0.5	-0.7	0.1	-0.2	1.3
(2a) Labour force participation	10.3	1.6	0.9	2.9	2.0	4.8	1.6	1.6	0.8	2.0	0.5	0.8	0.8	-0.3	0.1	0.0	1.0
(2b) Structural unemployment	-0.1	3.5	-0.3	1.4	-0.1	1.5	-0.7	-0.2	-0.1	0.0	-2.2	-0.6	-0.2	-0.4	0.0	-0.2	0.2
(3) Total Hit	7.5	5.5	4.3	3.9	2.8	2.1	1.1	0.9	-0.6	-0.9	-1.8	-2.0	-2.2	-2.5	-3.3	-3.3	-3.4
Memorandum item:																	
Output gap	-5.1	0.8	0.2	0.1	-2.1	-0.7	-3.4	0.5	-0.4	-3.2	0.7	-2.2	-0.8	-3.1	-1.7	-4.4	-0.5

	NOR	ITA*	DNK*	SWE*	LUX*	MEX	SVK	FIN	ESP*	GBR*	PRT*	CZE	IRL*	SVN*	HUN*	EST	ISL*	GRC*
(1) Productivity	-5.3	-2.3	-2.6	-5.8	-2.4	-7.0	-8.9	-8.6	4.4	-9.1	-2.4	-12.6	-5.4	-9.3	-16.5	-13.7	-10.1	-13.6
(1a) Capital/worker	-0.4	-1.7	-1.2	-0.6	-1.7	-3.9	-0.1	1.2	3.5	-1.7	-3.0	-0.9	-0.2	-2.8	-3.7	-8.4	-8.6	-4.5
(1b) Total factor productivity	-4.9	-0.6	-1.5	-5.3	-0.7	-3.6	-8.9	-9.7	0.9	-7.4	0.6	-11.9	-5.1	-6.6	-13.6	-6.0	-1.5	-9.5
(2) Employment	1.4	-1.8	-2.1	1.0	-2.6	1.7	2.3	1.7	-12.4	0.4	-7.3	2.0	-5.6	-4.6	2.1	-1.7	-5.8	-9.1
(2a) Labour force participation	1.3	0.9	-1.4	0.7	-1.8	2.9	1.6	1.0	-3.2	1.2	-2.8	1.2	-2.3	-2.4	4.2	-0.4	-4.5	-2.4
(2b) Structural unemployment	0.1	-2.7	-0.7	0.3	-0.8	-1.3	0.6	0.7	-9.2	-0.8	-4.5	0.8	-3.3	-2.2	-2.0	-1.2	-1.3	-6.7
(3) Total Hit	-3.9	-4.1	-4.7	-4.8	-5.0	-5.4	-6.7	-6.9	-8.0	-8.6	-9.7	-10.6	-11.0	-13.9	-14.3	-15.4	-15.9	-22.7
Memorandum item:																		
Output gap	-0.9	-5.1	-2.6	-1.5	-0.6	-4.7	-3.2	-3.8	-5.0	-1.0	-6.5	-4.8	-7.8	-5.2	-1.5	-3.6	-1.6	-12.8

Notes: An asterisk (*) denotes that country is judged to have experienced a banking crisis between 2007 and 2011 based on Laeven and Valencia (2012). Estimated effects of the crisis are measured relative to a counter-factual scenario in which trend productivity continues at its pre-crisis (2000-7) trend growth rate, structural unemployment rates remain at their pre-crisis (2007) levels and trend participation rates are projected to allow for evolving demographics by holding labour force entry and exit rates constant at pre-crisis levels.

Empirical Results

Figure 3. Contributions to the crisis hit on potential output for individual OECD countries

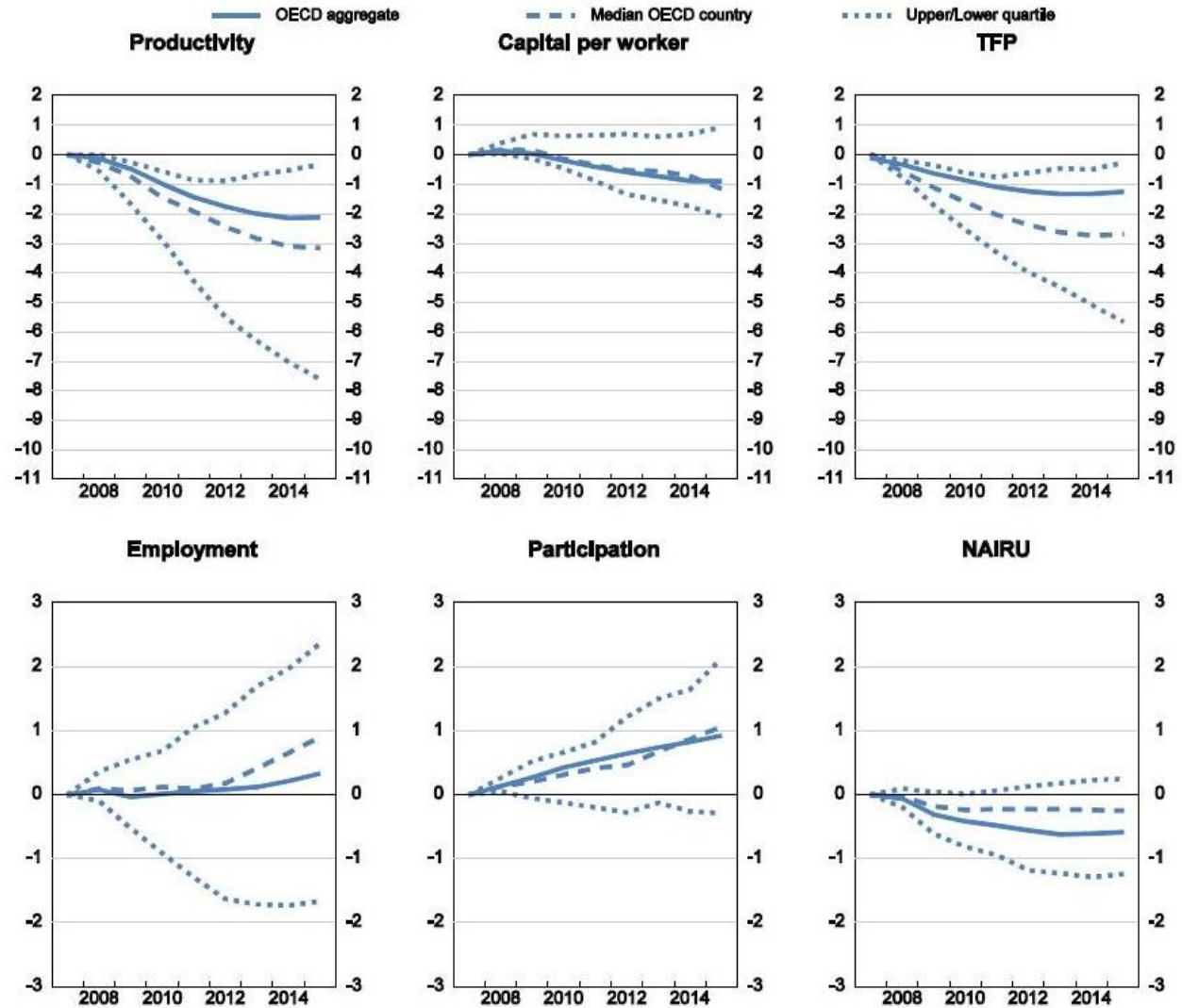


Note: An asterisk (*) denotes that country is judged to have experienced a banking crisis between 2007 and 2011 based on Laeven and Valencia (2012). Estimated effects of the crisis are measured relative to a counter-factual scenario in which trend productivity continues at its pre-crisis (2000-7) trend growth rate, structural unemployment rates remain at their pre-crisis (2007) levels and trend participation rates are projected to allow for evolving demographics by holding labour force entry and exit rates constant at pre-crisis levels.

Empirical Results

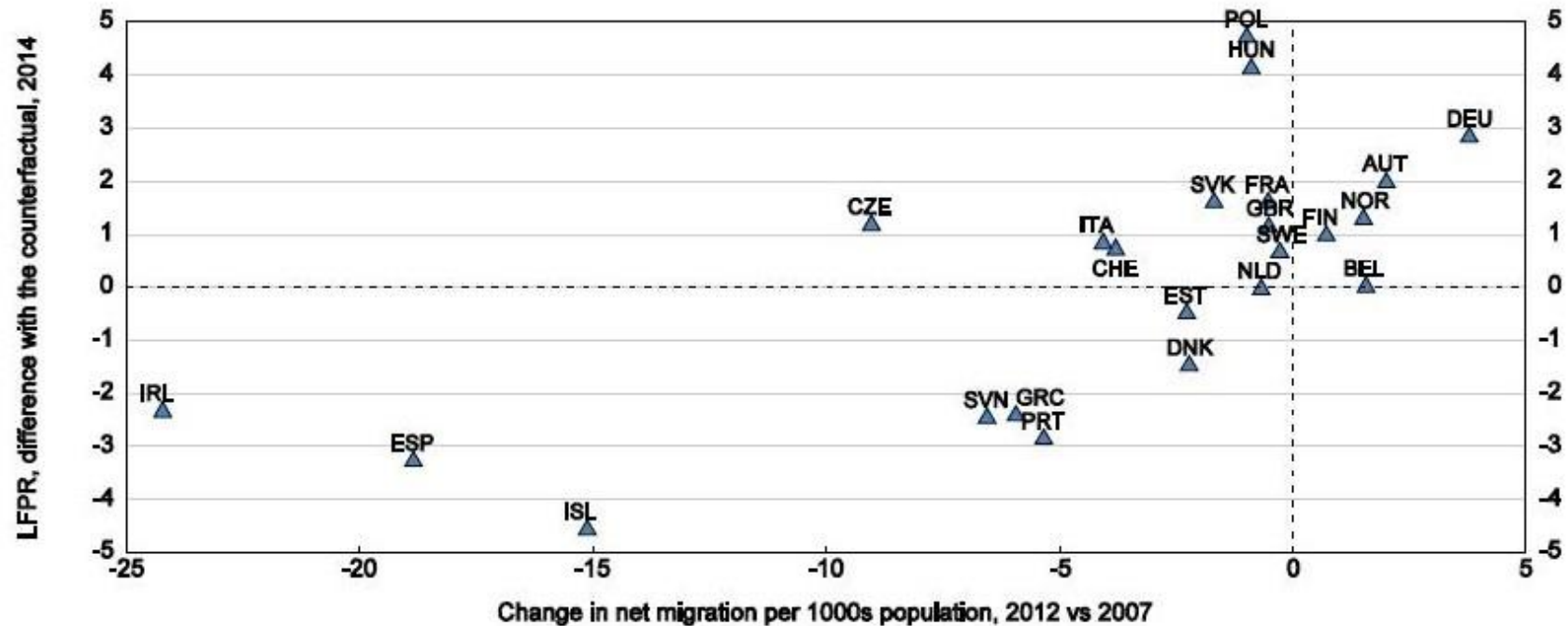
Figure 4. Estimated effects of the crisis on the components of potential output

Breakdown by components, deviation from the baseline



Empirical Results

Figure 5. The crisis hit to participation and the change in net migration
Percentage point difference



Source: OECD calculations based on OECD Economic Outlook, May 2014 long-term database.

Additional Findings

- Other Factors didn't reflect effects from financial crisis in some countries.
 - Positive effect of "faster post-crisis growth" attributed from investment boom.
 - Positive effects of "falls in structural unemployment" attributed from Policy reforms
 - Positive effects of increase trend labor participation

Excluding these effects gives an estimate of the crisis hit to aggregate "OECD potential output in 2014 which is revised from 2% to 3%"

Pre-crisis factors effects Y*

Table 2. The relationship between the loss in potential output and pre-crisis conditions

	Standard dev. of explanatory variable	Coefficient		Output gap, 2007	Adj. R2	Observations
Pre-crisis macro conjuncture						
Fiscal balance, 2007, % of GDP	4.4	0.147 0.055		-1.704 ***	0.50 -0.03	30
Current account balance, 2007, % of GDP	7.3	0.295 0.513	** ***	-1.346 ***	0.56 0.31	32
Real interest rate, average 2003-2007	2.3	0.155 1.474	 **	-1.568 ***	0.46 0.10	30
Housing investment, % of GDP ¹	1.8	-0.385 -1.082	 **	-1.127 *	0.27 0.16	22
Total investment, % of GDP ¹	2.7	-0.379 -0.897	 ***	-1.374 ***	0.43 0.22	24
CPI inflation, 2003-07, % points	1.2	-1.580 -2.630	** ***	-1.485 ***	0.55 0.20	32
Pre-crisis indebtedness (2007, % of GDP)						
Gross government debt	33	-0.023 0.026		-1.773 ***	0.50 -0.02	30
Net government debt	49	-0.006 0.024		-1.716 ***	0.49 0.00	30
Net foreign debt	55	-0.036 -0.059	** ***	-1.457 ***	0.56 0.23	32
Net worth, total economy	57	0.034 0.060	** ***	-1.408 ***	0.57 0.26	30
Net worth, household	67	0.016 0.045	 ***	-1.488 ***	0.51 0.20	30
Pre-crisis structural conditions						
Product Market Regulation, 2008 ²	0.3	-7.983 -10.206	*** **	-1.456 ***	0.57 0.14	28
Trade openness, 2007 ³	43	-0.007 -0.057	 **	-1.642 ***	0.47 0.12	32
Financial openness, 2007 ⁴	512	0.001 -0.002	 ***	-1.632 ***	0.49 -0.01	30
Pre-crisis potential output growth rate. (average 2000-7, % pa)						
Potential output per capita growth rate	1.2	0.625 -1.546		-1.835 ***	0.48 0.05	32
Trend labour efficiency growth rate	1.3	0.379 -0.571		-1.750 ***	0.47 -0.02	32
Potential employment growth rate	0.8	1.589 1.706		-1.688 ***	0.51 0.01	32
Capital per worker growth rate	1.8	-1.014 -2.121	* ***	-1.288 ***	0.55 0.35	32

Regress Y* on each variables separately.

Additional Findings

- higher inflation and positive output gaps → subsequent potential output losses.
- - high investment
 - larger current account deficits
 - low real interest rates
 - high total economy indebtedness
- faster growing capital-per-worker → post-crisis potential output losses.

Larger potential output losses.



Q&A

Thank you for your attention. 😊