



EUROPEAN CENTRAL BANK

EUROSYSTEM

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Structural policies, worker flows and resilience: evidence for the euro area using individual-level micro data

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- ▶ As a result, the re-connection between output and employment seems to reflect a possible structural change in their underlying Okun-style's relationship.

Introduction

Macroeconomic evidence

An estimated simple static relationship between employment/unemployment and GDP illustrates the good labour market performance since the recovery in the euro area.

Figure 1: Residuals from static Okun estimates



Sources: ECB Economic Bulletin, Issue 2/2019. Notes: Residuals from a static Okun relationship that relates the y-o-y changes in the unemployment rate, the y-o-y growth rate in total employment and the y-o-y growth rate in total hours to the contemporaneous y-o-y growth rate in real GDP.

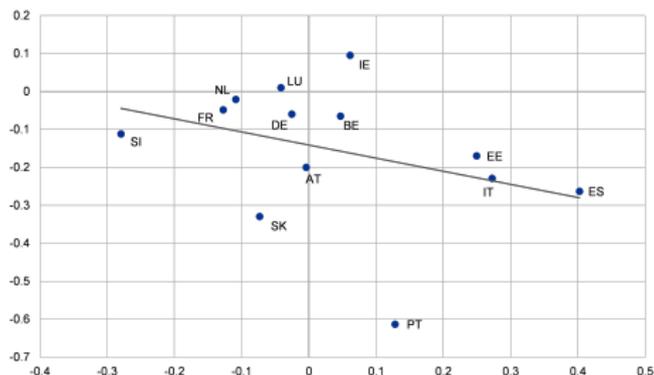
Introduction

Macroeconomic evidence

Structural policies may have contributed to an increase in the responsiveness of employment to GDP during the recovery in several euro area countries.

Figure 2: Change in employment elasticities and structural indicators

(x-axis: change in employment to GDP elasticity; y-axis: change in regulations)



Sources: ECB Economic Bulletin, Issue 6/2016. Notes: Changes in synthetic indicators of the strictness of product market regulation (PMR) and employment protection legislation (EPL) are weighted equally. Reported changes in EPL and PMR are plotted for countries for which both indicators are available for 2008 and 2013.

Objectives of this paper

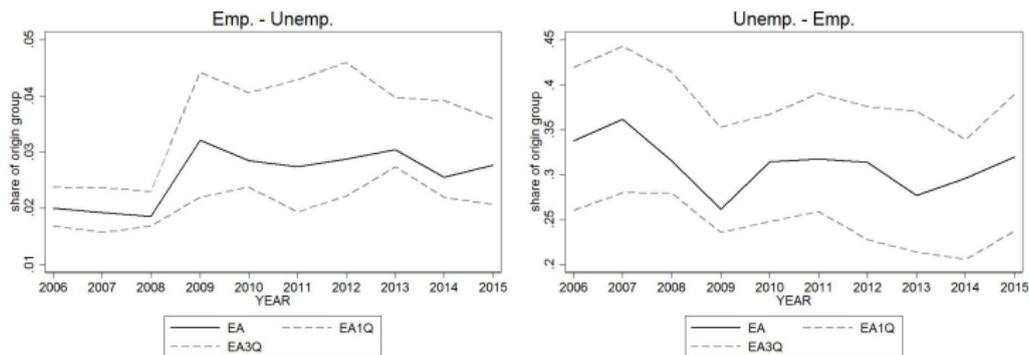
This paper uses micro (individual-level) data from the anonymised Eurostat Labour Force Survey (EU-LFS) on worker flows across employment and unemployment, and their socio-demographic compositions (i.e., gender, age, and education) to investigate whether

- ▶ the flexibility of the euro area labour market increased during the recovery from the crisis, as well as the responsiveness of individual worker flows to output;
- ▶ structural policies implemented during the crisis have changed the behaviour of labour market flows in the euro area, especially in reforming countries.

Objectives of this paper

Despite some heterogeneity, worker flows across employment and unemployment share a common pattern across all countries.

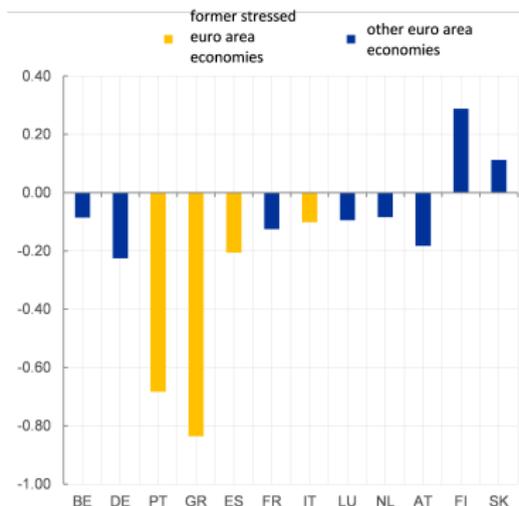
Figure 3: Evolution of worker flows in the euro area



Objectives of this paper

Greece, Portugal and Spain are identified as the group of reforming countries based on the significant reform activity over the period examined.

Figure 4: Progress in labour and product market reforms in the euro area

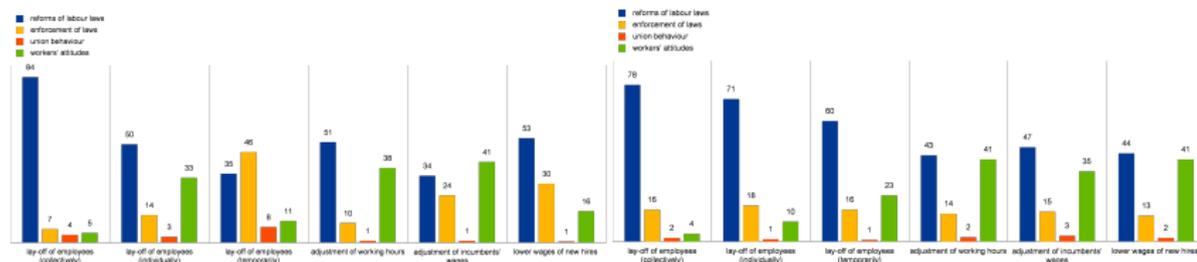


Notes: reform progress is defined as the change between 2008 and 2013 in a composite indicator comprising labour and product market indicators.

Objectives of this paper

According to the WDN3 survey, Greek and Spanish firms said that the major factor behind the increase in the ease of labour input and wage adjustments is the reforms of labour market laws between 2010 and 2013.

Figure 5: Factors behind labour market adjustment channels in Greece and Spain between 2013 and 2010



Sources: ECB Occasional Paper Series No. 210/June 2018. Notes: Firms with fewer than five employees are excluded from the calculations. The percentages are derived from the weighted answers to questions to reflect overall firm population and are rescaled to exclude non-response.

We estimate the following Linear Probability Models:

$$\begin{aligned} flow_{i,c,t} = & \beta_1 GDPgrowth_{c,t-1} + \beta_2 crisis_{c,t} + \beta_3 GDPgrowth_{c,t-1} * crisis_{c,t} \\ & + \beta_4 X_{i,c,t} + FE + \mu_{i,c,t} \end{aligned}$$

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$flow_{i,c,t}$ refers to worker flows from unemployment to employment (U-E) or from employment to unemployment (E-U). It is a dummy variable which is equal to 1 if the individual flows in the specific year and 0 if she remains in the origin group.

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$I_{c,t}$ represents policy variables, which are included in the model one at a time.

Worker flows and output relationship

Table 1: Comparing responsiveness of worker flows to GDP growth in reforming period (2008-2015) with pre-crisis period (2000-2007)

	EA countries				Reforming countries			
	2000-2007 U-E	2008-2015 U-E	2000-2007 E-U	2008-2015 E-U	2000-2007 U-E	2008-2015 U-E	2000-2007 E-U	2008-2015 E-U
GDP growth (t-1)	0.0068*** (0.0019)	0.0099*** (0.0012)	-0.0011*** (0.0002)	-0.0026*** (0.0002)	0.0101** (0.0039)	0.0284*** (0.0049)	-0.0008* (0.0004)	-0.0049*** (0.0010)

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GDP growth (t-1)	0.0068*** (0.0019)	0.0099*** (0.0012)	-0.0011*** (0.0002)	-0.0026*** (0.0002)	0.0101** (0.0039)	0.0284*** (0.0049)	-0.0008* (0.0004)	-0.0049*** (0.0010)
GDP growth (t-1)*crisis		-0.0023 (0.0014)		0.0005* (0.0002)		-0.0145*** (0.0036)		0.0018** (0.0007)
crisis		-0.0253*** (0.0073)		0.0033** (0.0011)		-0.0517*** (0.0132)		0.0144*** (0.0031)
male	0.0657*** (0.0044)	-0.0065 (0.0045)	-0.0065*** (0.0005)	0.0017** (0.0007)	0.0948*** (0.0079)	0.0043 (0.0071)	-0.0123*** (0.0011)	0.0053** (0.0018)
education								
medium	0.0515*** (0.0050)	0.0577*** (0.0051)	-0.0087*** (0.0006)	-0.0180*** (0.0009)	0.0258* (0.0102)	0.0464*** (0.0090)	-0.0084*** (0.0015)	-0.0235*** (0.0025)
high	0.1126*** (0.0075)	0.1077*** (0.0069)	-0.0176*** (0.0007)	-0.0338*** (0.0010)	0.0815*** (0.0111)	0.0805*** (0.0100)	-0.0198*** (0.0014)	-0.0484*** (0.0021)
age								
25-34	-0.0189** (0.0058)	0.0253*** (0.0070)	-0.0257*** (0.0015)	-0.0355*** (0.0022)	-0.0481*** (0.0100)	0.0533*** (0.0117)	-0.0289*** (0.0027)	-0.0522*** (0.0060)
35-44	-0.0389*** (0.0064)	-0.0135 (0.0071)	-0.0373*** (0.0014)	-0.0547*** (0.0021)	-0.1089*** (0.0112)	0.0003 (0.0118)	-0.0438*** (0.0027)	-0.0800*** (0.0058)
45-54	-0.0814*** (0.0071)	-0.0734*** (0.0070)	-0.0432*** (0.0014)	-0.0637*** (0.0021)	-0.1862*** (0.0132)	-0.0745*** (0.0113)	-0.0547*** (0.0026)	-0.0939*** (0.0058)
55-64	-0.1848*** (0.0098)	-0.1422*** (0.0081)	-0.0475*** (0.0014)	-0.0722*** (0.0021)	-0.3490*** (0.0156)	-0.1408*** (0.0124)	-0.0589*** (0.0026)	-0.1137*** (0.0058)
constant	0.2513*** (0.0176)	0.2718*** (0.0114)	0.0871*** (0.0026)	0.1120*** (0.0026)	0.4745*** (0.0186)	0.3273*** (0.0146)	0.0729*** (0.0033)	0.1246*** (0.0060)
N	124999	165528	1290148	1514868	51608	65700	490094	383067
R-sq	0.0456	0.0665	0.0126	0.0214	0.0771	0.0615	0.0126	0.0244

Worker flows and output relationship

- ▶ Results show a change in the GDP responsiveness when comparing periods before and after the crisis.
- ▶ One hypothesis is that the higher responsiveness of euro area worker flows to GDP since the rebound may have been influenced by structural policies implemented during the post-crisis period.
- ▶ The largest responsiveness of both worker flows to GDP is observed for the group of reforming countries after the crisis.

Worker flows and output relationship

Turning to the more general results for gender, age and education, we find that

- ▶ the probability of losing a job and becoming unemployed seems to be higher for young, female, low-skilled workers;
- ▶ the increase in the probability of finding a job, conditional on being unemployed, is mainly been driven by young, male and more educated workforce (i.e., medium- and high-skilled);
- ▶ in the group of reforming countries, age plays a stronger role in determining the flow from unemployment into employment.

Worker flows and output relationship

Table 2: Alternative method of capturing change in responsiveness of worker flows to GDP growth by dummyming pre-crisis period

	EA countries		Reforming countries	
	2000-2015 U-E	2000-2015 E-U	2000-2015 U-E	2000-2015 E-U
GDP growth (t-1)	0.0167*** (0.0013)	-0.0031*** (0.0002)	0.0145*** (0.0026)	-0.0044*** (0.0004)
GDP growth (t-1)*pre-crisis	-0.0084*** (0.0015)	0.0007*** (0.0002)	-0.0090*** (0.0021)	0.0023*** (0.0003)
pre-crisis	0.1501*** (0.0112)	-0.0110*** (0.0014)	0.1827*** (0.0101)	-0.0202*** (0.0013)
GDP growth (t-1)*crisis	-0.0075*** (0.0014)	0.0008*** (0.0002)	-0.0093** (0.0030)	0.0028*** (0.0005)
crisis	-0.0375*** (0.0067)	0.0032** (0.0010)	-0.0499*** (0.0073)	0.0026* (0.0010)
constant	0.2422*** (-0.0062)	0.0940*** (-0.0013)	0.3423*** (-0.0058)	0.0975*** (-0.0017)
N	291047	2857299	123230	1031656
R-sq	0.0637	0.0194	0.0992	0.0232

Worker flows and output relationship

- ▶ The estimation is carried out over the whole sample period 2000-2015.
- ▶ We introduce an intercept dummy variable for the period 2000-2007 as well as an interaction of this dummy with GDP growth (t-1) which capture the change in the employment-GDP elasticity.
- ▶ We find that the responsiveness of worker flows to GDP dynamics is higher after the crisis compared to the pre-crisis ($GDPgrowth_{t-1} * pre - crisis$), especially for the group of reforming countries.

Worker flows and reforms

Now, we attempt to more directly relate changes in worker flows to structural policies by estimating the direct impacts of some key policy indicators, which are designed to capture institutional rigidities in labour and product markets, on worker flows for both the euro area and reforming countries.

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 - ▶ the OECD indicator of Employment Protection Legislation (EPL) for regular contracts;

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- ▶ We introduce, one at a time, the following indicators of labour and product market regulation:
 - ▶ the OECD indicator of Employment Protection Legislation (EPL) for regular contracts;
 - ▶ the OECD indicator of regulation in energy, transport and communications (PMR ETCR);
 - ▶ the degree of centralisation of collective bargaining index developed by the Fraser Institute (CCB).

Table 3: Impacts of institutional rigidities on worker flows (euro area countries)

EA countries	2000-2015	2000-2015	2000-2015	2000-2015	2000-2015	2000-2015
	U-E	E-U	U-E	E-U	U-E	E-U
GDP growth (t-1)	0.0315*** (0.0025)	-0.0047*** (0.0003)	0.0178*** (0.0014)	-0.0032*** (0.0002)	0.0122*** (0.0014)	-0.0028*** (0.0002)
GDP growth (t-1)*crisis	0.0009 (0.0039)	0.0010* (0.0005)	-0.0032 (0.0020)	0.0009*** (0.0003)	0.0018 (0.0019)	0.0004 (0.0003)
crisis	-0.0443*** (0.0074)	0.0049*** (0.0009)	-0.0757*** (0.0057)	0.0069*** (0.0007)	-0.0449*** (0.0062)	0.0049*** (0.0008)

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EPL (t-1)	-0.1263** (0.0519)	-0.0828*** (0.0075)				

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EPL (t-1)	-0.1263** (0.0519)	-0.0828*** (0.0075)				
PMR (t-1)			-0.0187*** (0.0044)	-0.0017*** (0.0005)		

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GDP growth (t-1)*crisis	0.0009 (0.0039)	0.0010* (0.0005)	-0.0032 (0.0020)	0.0009*** (0.0003)	0.0018 (0.0019)	0.0004 (0.0003)
crisis	-0.0443*** (0.0074)	0.0049*** (0.0009)	-0.0757*** (0.0057)	0.0069*** (0.0007)	-0.0449*** (0.0062)	0.0049*** (0.0008)
EPL (t-1)	-0.1263** (0.0519)	-0.0828*** (0.0075)				
PMR (t-1)			-0.0187*** (0.0044)	-0.0017*** (0.0005)		
CCB (t-1)					-0.0774*** (0.0057)	0.0061*** (0.0006)
constant	0.2364*** (0.0182)	0.1161*** (0.0027)	0.4135*** (0.0179)	0.0740*** (0.0025)	0.3171*** (0.0176)	0.0804*** (0.0024)
N	203072	2088705	272002	2667854	272002	2667854
R-sq	0.0517	0.0213	0.0598	0.0202	0.0604	0.0203

Table 4: Impacts of institutional rigidities on worker flows (reforming countries)

Reforming countries	2000-2015	2000-2015	2000-2015	2000-2015	2000-2015	2000-2015
	U-E	E-U	U-E	E-U	U-E	E-U
GDP growth (t-1)	0.0431*** (0.0048)	-0.0073*** (0.0007)	0.0241*** (0.0025)	-0.0024*** (0.0004)	0.0167*** (0.0021)	-0.0025*** (0.0003)
GDP growth (t-1)*crisis	-0.0417*** (0.0089)	0.0124*** (0.0018)	-0.0146*** (0.0027)	0.0020*** (0.0005)	-0.0150*** (0.0023)	0.0021*** (0.0004)
crisis	-0.0800*** (0.0070)	0.0111*** (0.0009)	-0.0382*** (0.0062)	0.0050*** (0.0008)	-0.0555*** (0.0072)	0.0080*** (0.0009)

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Reforming countries	2000-2015	2000-2015	2000-2015	2000-2015	2000-2015	2000-2015
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GDP growth (t-1)	0.0431*** (0.0048)	-0.0073*** (0.0007)	0.0241*** (0.0025)	-0.0024*** (0.0004)	0.0167*** (0.0021)	-0.0025*** (0.0003)
GDP growth (t-1)*crisis	-0.0417*** (0.0089)	0.0124*** (0.0018)	-0.0146*** (0.0027)	0.0020*** (0.0005)	-0.0150*** (0.0023)	0.0021*** (0.0004)
crisis	-0.0800*** (0.0070)	0.0111*** (0.0009)	-0.0382*** (0.0062)	0.0050*** (0.0008)	-0.0555*** (0.0072)	0.0080*** (0.0009)
EPL (t-1)	-0.1619*** (0.0228)	-0.0712*** (0.0121)				

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GDP growth (t-1)*crisis	-0.0417*** (0.0089)	0.0124*** (0.0018)	-0.0146*** (0.0027)	0.0020*** (0.0005)	-0.0150*** (0.0023)	0.0021*** (0.0004)
crisis	-0.0800*** (0.0070)	0.0111*** (0.0009)	-0.0382*** (0.0062)	0.0050*** (0.0008)	-0.0555*** (0.0072)	0.0080*** (0.0009)
EPL (t-1)	-0.1619*** (0.0228)	-0.0712*** (0.0121)				
PMR (t-1)			-0.0322*** (0.0062)	-0.0078*** (0.0009)		

Worker flows and reforms

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	U-E	E-U	U-E	E-U	U-E	E-U
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GDP growth (t-1)*crisis	-0.0417*** (0.0089)	0.0124*** (0.0018)	-0.0146*** (0.0027)	0.0020*** (0.0005)	-0.0150*** (0.0023)	0.0021*** (0.0004)
crisis	-0.0800*** (0.0070)	0.0111*** (0.0009)	-0.0382*** (0.0062)	0.0050*** (0.0008)	-0.0555*** (0.0072)	0.0080*** (0.0009)
EPL (t-1)	-0.1619*** (0.0228)	-0.0712*** (0.0121)				
PMR (t-1)			-0.0322*** (0.0062)	-0.0078*** (0.0009)		
CCB (t-1)					-0.0640*** (0.0061)	0.0082*** (0.0008)
constant	0.2918*** (0.0845)	0.2146*** (0.0150)	0.6500*** (0.0586)	0.1080*** (0.0095)	0.5151*** (0.0341)	0.1189*** (0.0054)
N	79970	647934	123230	1031656	123230	1031656
R-sq	0.0960	0.0247	0.1042	0.0238	0.1045	0.0238

Table 5: Alternative method of capturing change in responsiveness of flows to GDP growth by including inverted indicators of institutional rigidities (euro area countries)

EA countries	2000-2015	2000-2015	2000-2015	2000-2015	2000-2015	2000-2015
	U-E	E-U	U-E	E-U	U-E	E-U
GDP growth (t-1)	0.2751*** (0.0221)	-0.0670*** (0.0037)	0.0522*** (0.0034)	-0.0090*** (0.0005)	0.0208*** (0.0040)	-0.0014* (0.0005)
crisis	-0.0830*** (0.0094)	0.0042*** (0.0012)	-0.0304*** (0.0084)	0.0012 (0.0011)	-0.0865*** (0.0070)	0.0075*** (0.0010)
GDP growth (t-1)*crisis	-0.0248*** (0.0035)	0.0007 (0.0005)	-0.0223*** (0.0022)	0.0022*** (0.0003)	-0.0194*** (0.0023)	0.0020*** (0.0003)

Table 5: Alternative method of capturing change in responsiveness of flows to GDP growth by including inverted indicators of institutional rigidities (euro area countries)

EA countries	2000-2015	2000-2015	2000-2015	2000-2015	2000-2015	2000-2015
	U-E	E-U	U-E	E-U	U-E	E-U
GDP growth (t-1)	0.2751*** (0.0221)	-0.0670*** (0.0037)	0.0522*** (0.0034)	-0.0090*** (0.0005)	0.0208*** (0.0040)	-0.0014* (0.0005)
crisis	-0.0830*** (0.0094)	0.0042*** (0.0012)	-0.0304*** (0.0084)	0.0012 (0.0011)	-0.0865*** (0.0070)	0.0075*** (0.0010)
GDP growth (t-1)*crisis	-0.0248*** (0.0035)	0.0007 (0.0005)	-0.0223*** (0.0022)	0.0022*** (0.0003)	-0.0194*** (0.0023)	0.0020*** (0.0003)
EPL (t-1)	0.1674*** (0.0200)	0.0098*** (0.0028)				
GDP growth (t-1)*EPL (t-1)	0.0491*** (0.0044)	-0.0123*** (0.0007)				

Table 5: Alternative method of capturing change in responsiveness of flows to GDP growth by including inverted indicators of institutional rigidities (euro area countries)

EA countries	2000-2015	2000-2015	2000-2015	2000-2015	2000-2015	2000-2015
	U-E	E-U	U-E	E-U	U-E	E-U
GDP growth (t-1)	0.2751*** (0.0221)	-0.0670*** (0.0037)	0.0522*** (0.0034)	-0.0090*** (0.0005)	0.0208*** (0.0040)	-0.0014* (0.0005)
crisis	-0.0830*** (0.0094)	0.0042*** (0.0012)	-0.0304*** (0.0084)	0.0012 (0.0011)	-0.0865*** (0.0070)	0.0075*** (0.0010)
GDP growth (t-1)*crisis	-0.0248*** (0.0035)	0.0007 (0.0005)	-0.0223*** (0.0022)	0.0022*** (0.0003)	-0.0194*** (0.0023)	0.0020*** (0.0003)
EPL (t-1)	0.1674*** (0.0200)	0.0098*** (0.0028)				
GDP growth (t-1)*EPL (t-1)	0.0491*** (0.0044)	-0.0123*** (0.0007)				
PMR (t-1)			0.0552*** (0.0039)	0.0143*** (0.0006)		
GDP growth (t-1)*PMR (t-1)			0.0219*** (0.0012)	-0.0037*** (0.0002)		

Table 5: Alternative method of capturing change in responsiveness of flows to GDP growth by including inverted indicators of institutional rigidities (euro area countries)

EA countries	2000-2015	2000-2015	2000-2015	2000-2015	2000-2015	2000-2015
	U-E	E-U	U-E	E-U	U-E	E-U
GDP growth (t-1)	0.2751*** (0.0221)	-0.0670*** (0.0037)	0.0522*** (0.0034)	-0.0090*** (0.0005)	0.0208*** (0.0040)	-0.0014* (0.0005)
crisis	-0.0830*** (0.0094)	0.0042*** (0.0012)	-0.0304*** (0.0084)	0.0012 (0.0011)	-0.0865*** (0.0070)	0.0075*** (0.0010)
GDP growth (t-1)*crisis	-0.0248*** (0.0035)	0.0007 (0.0005)	-0.0223*** (0.0022)	0.0022*** (0.0003)	-0.0194*** (0.0023)	0.0020*** (0.0003)
EPL (t-1)	0.1674*** (0.0200)	0.0098*** (0.0028)				
GDP growth (t-1)*EPL (t-1)	0.0491*** (0.0044)	-0.0123*** (0.0007)				
PMR (t-1)			0.0552*** (0.0039)	0.0143*** (0.0006)		
GDP growth (t-1)*PMR (t-1)			0.0219*** (0.0012)	-0.0037*** (0.0002)		
CCB (t-1)					0.0511*** (0.0070)	-0.0018* (0.0009)
GDP growth (t-1)*CCB (t-1)					0.0007 (0.0006)	-0.0009*** (0.0001)
constant	-0.3948*** (0.0969)	0.03854** (0.0135)	0.3990*** (0.0152)	0.06025*** (0.0023)	-0.1758** (0.0537)	0.1050*** (0.0071)
N	203072	2088705	272002	2667854	272002	2667854
R-sq	0.0461	0.0210	0.0574	0.0201	0.0542	0.0192

Table 6: Alternative method of capturing change in responsiveness of flows to GDP growth by including inverted indicators of institutional rigidities (reforming countries)

Reforming countries	2000-2015	2000-2015	2000-2015	2000-2015	2000-2015	2000-2015
	U-E	E-U	U-E	E-U	U-E	E-U
GDP growth (t-1)	0.2682*** (0.0244)	-0.0726*** (0.0047)	0.0450*** (0.0033)	-0.0099*** (0.0006)	0.0803*** (0.0083)	-0.0223*** (0.0016)
crisis	-0.0876*** (0.0100)	0.0049** (0.0016)	-0.0000 (0.0097)	0.0066*** (0.0015)	-0.0520*** (0.0080)	0.0035** (0.0012)
GDP growth (t-1)*crisis	-0.0268*** (0.0039)	-0.0004 (0.0007)	-0.0371*** (0.0027)	0.0041*** (0.0005)	-0.0104*** (0.0027)	-0.0005 (0.0005)

Worker flows and reforms

Table 6: Alternative method of capturing change in responsiveness of flows to GDP growth by including inverted indicators of institutional rigidities (reforming countries)

Reforming countries	2000-2015	2000-2015	2000-2015	2000-2015	2000-2015	2000-2015
	U-E	E-U	U-E	E-U	U-E	E-U
GDP growth (t-1)	0.2682*** (0.0244)	-0.0726*** (0.0047)	0.0450*** (0.0033)	-0.0099*** (0.0006)	0.0803*** (0.0083)	-0.0223*** (0.0016)
crisis	-0.0876*** (0.0100)	0.0049** (0.0016)	-0.0000 (0.0097)	0.0066*** (0.0015)	-0.0520*** (0.0080)	0.0035** (0.0012)
GDP growth (t-1)*crisis	-0.0268*** (0.0039)	-0.0004 (0.0007)	-0.0371*** (0.0027)	0.0041*** (0.0005)	-0.0104*** (0.0027)	-0.0005 (0.0005)
EPL (t-1)	0.2083*** (0.0199)	0.0073* (0.0030)				
GDP growth (t-1)*EPL (t-1)	0.0472*** (0.0049)	-0.0134*** (0.0009)				

Table 6: Alternative method of capturing change in responsiveness of flows to GDP growth by including inverted indicators of institutional rigidities (reforming countries)

Reforming countries	2000-2015	2000-2015	2000-2015	2000-2015	2000-2015	2000-2015
	U-E	E-U	U-E	E-U	U-E	E-U
GDP growth (t-1)	0.2682*** (0.0244)	-0.0726*** (0.0047)	0.0450*** (0.0033)	-0.0099*** (0.0006)	0.0803*** (0.0083)	-0.0223*** (0.0016)
crisis	-0.0876*** (0.0100)	0.0049** (0.0016)	-0.0000 (0.0097)	0.0066*** (0.0015)	-0.0520*** (0.0080)	0.0035** (0.0012)
GDP growth (t-1)*crisis	-0.0268*** (0.0039)	-0.0004 (0.0007)	-0.0371*** (0.0027)	0.0041*** (0.0005)	-0.0104*** (0.0027)	-0.0005 (0.0005)
EPL (t-1)	0.2083*** (0.0199)	0.0073* (0.0030)				
GDP growth (t-1)*EPL (t-1)	0.0472*** (0.0049)	-0.0134*** (0.0009)				
PMR (t-1)			0.0447*** (0.0039)	0.0145*** (0.0005)		
GDP growth (t-1)*PMR (t-1)			0.0247*** (0.0013)	-0.0047*** (0.0002)		

Table 6: Alternative method of capturing change in responsiveness of flows to GDP growth by including inverted indicators of institutional rigidities (reforming countries)

Reforming countries	2000-2015		2000-2015		2000-2015	
	U-E	E-U	U-E	E-U	U-E	E-U
GDP growth (t-1)	0.2682*** (0.0244)	-0.0726*** (0.0047)	0.0450*** (0.0033)	-0.0099*** (0.0006)	0.0803*** (0.0083)	-0.0223*** (0.0016)
crisis	-0.0876*** (0.0100)	0.0049** (0.0016)	-0.0000 (0.0097)	0.0066*** (0.0015)	-0.0520*** (0.0080)	0.0035** (0.0012)
GDP growth (t-1)*crisis	-0.0268*** (0.0039)	-0.0004 (0.0007)	-0.0371*** (0.0027)	0.0041*** (0.0005)	-0.0104*** (0.0027)	-0.0005 (0.0005)
EPL (t-1)	0.2083*** (0.0199)	0.0073* (0.0030)				
GDP growth (t-1)*EPL (t-1)	0.0472*** (0.0049)	-0.0134*** (0.0009)				
PMR (t-1)			0.0447*** (0.0039)	0.0145*** (0.0005)		
GDP growth (t-1)*PMR (t-1)			0.0247*** (0.0013)	-0.0047*** (0.0002)		
CCB (t-1)					0.0402*** (0.0080)	-0.0046*** (0.0013)
GDP growth (t-1)*CCB (t-1)					0.0179*** (0.0014)	-0.0047*** (0.0003)
constant	-0.6060*** (0.0967)	0.1229*** (0.0147)	0.5241*** (0.0132)	0.0430*** (0.0021)	0.1553** (0.0527)	0.0546*** (0.0087)
N	79970	647934	123230	1031656	123230	1031656
R-sq	0.0860	0.0242	0.0986	0.0241	0.0943	0.0234

Worker flows and reforms

- ▶ The econometric results in Tables 3 and 4 show that the vast majority of the institutional variables are statistically significant and negatively signed, indicating that stricter regulation in product and labour markets tend to reduce worker flows.
- ▶ The interaction terms between GDP growth and the various policy variables in Table 5 and 6 provide a direct indication that reforms (indicated by an increase in the inverted policy variables) increase the responsiveness of worker flows to GDP growth.

Conclusions

- ▶ We find micro evidence of a higher responsiveness of worker flows to changes in GDP after the crisis, particularly for a group of euro area countries which implemented significant reforms.

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- ▶ The above results are robust to a set of alternative specifications:
 - ▶ using only workers hired on permanent contracts;
 - ▶ restricting the country sample to have a balanced panel;
 - ▶ accounting for the impact of non-linearities;
 - ▶ checking the change in flows responsiveness to output by comparing the pre-crisis period 2000-2007 with the whole sample period 2000-2015.

Conclusions

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Conclusions

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- ▶ In terms of resilience, reforms can lead to a stronger response of worker flows to economic activity, implying that firms
 - ▶ can more easily adjust employment to changes in the economic cycle, and therefore reduce the economic costs and output losses associated with adverse shocks

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- ▶ In terms of resilience, reforms can lead to a stronger response of worker flows to economic activity, implying that firms
 - ▶ can more easily adjust employment to changes in the economic cycle, and therefore reduce the economic costs and output losses associated with adverse shocks
 - ▶ which, in turn, will increase profits and create higher sustainable employment and output growth which will further enhance resilience to adverse shocks.

Background slides

Worker flows and output relationship

Table 7: Permanent contracts: changes in responsiveness of worker flows to GDP growth

	EA countries		Reforming countries	
	2000-2007 U-E	2008-2015 U-E	countries U-E	2008-2015 U-E
GDP growth (t-1)	0.0066*** (0.0019)	0.0084*** (0.0011)	0.0099** (0.0044)	0.0172*** (0.0040)
GDP growth (t-1)*crisis		-0.0014 (0.0013)		-0.0085** (0.0030)
crisis		-0.0172** (0.0066)		-0.0237** (0.0104)
constant	0.1433*** (0.0170)	0.0889*** (0.0098)	0.1626*** (0.0201)	0.0879*** (0.0104)
N	97547	137510	36072	55735
R-sq	0.0518	0.0840	0.0330	0.0311

Background slides

Worker flows and output relationship

Table 8: Balanced panel: changes in responsiveness of worker flows to GDP growth

EA countries	2000-2007	2008-2015	2000-2007	2008-2015
	U-E	U-E	E-U	E-U
GDP growth	0.0068*** (0.0019)	0.0075*** (0.0009)	-0.0011*** (0.0002)	-0.0027*** (0.0002)
GDP growth (t-1)*crisis		-0.0002 (0.0011)		0.0004* (0.0002)
crisis		-0.0317*** (0.0066)		0.0042*** (0.0012)
constant	0.2569*** (0.0175)	0.2662*** (0.0109)	0.0878*** (0.0027)	0.1161*** (0.0032)
N	123662	150964	1234156	1169917
R-sq	0.0462	0.0603	0.0128	0.0252

Background slides

Worker flows and output relationship

Table 9: Alternative method of capturing change in responsiveness of worker flows to GDP growth by comparing pre-crisis period with whole sample period

	EA countries				Reforming countries			
	2000-2007 U-E	2008-2015 U-E	2000-2007 E-U	2008-2015 E-U	2000-2007 U-E	2008-2015 U-E	2000-2007 E-U	2008-2015 E-U
GDP growth	0.0074*** (0.0017)	0.0126*** (0.0009)	-0.0020*** (0.0002)	-0.0027*** (0.0001)	0.0101*** (0.0039)	0.0166*** (0.0020)	-0.0008* (0.0004)	-0.0016*** (0.0003)
GDP growth (t-1)*crisis		-0.0042*** (0.0012)		0.0006** (0.0002)		-0.0178*** (0.0023)		0.0018*** (0.0004)
crisis		-0.0418*** (0.0066)		0.0035*** (0.0010)		0.0326*** (0.0087)		-0.0026* (0.0015)
male	0.0585*** (0.0045)	0.0133*** (0.0034)	-0.0058*** (0.0005)	-0.0010* (0.0005)	0.0948*** (0.0079)	0.0278*** (0.0057)	-0.0123*** (0.0011)	-0.0018 (0.0012)
education								
medium	0.0556*** (0.0051)	0.0565*** (0.0039)	-0.0097*** (0.0006)	-0.0143*** (0.0006)	0.0258* (0.0102)	0.0439*** (0.0072)	-0.0084*** (0.0015)	-0.0171*** (0.0016)
high	0.1190*** (0.0075)	0.1127*** (0.0055)	-0.0183*** (0.0007)	-0.0282*** (0.0007)	0.0815*** (0.0111)	0.0845*** (0.0079)	-0.0198*** (0.0014)	-0.0374*** (0.0014)
age								
25-34	-0.0167** (0.0060)	0.0093 (0.0050)	-0.0269*** (0.0015)	-0.0312*** (0.0015)	-0.0481*** (0.0100)	0.0169* (0.0085)	-0.0289*** (0.0027)	-0.0379*** (0.0032)
35-44	-0.0378*** (0.0065)	-0.0254*** (0.0053)	-0.0383*** (0.0014)	-0.0476*** (0.0014)	-0.1089*** (0.0112)	-0.0368*** (0.0089)	-0.0438*** (0.0027)	-0.0605*** (0.0031)
45-54	-0.0886*** (0.0072)	-0.0812*** (0.0053)	-0.0436*** (0.0014)	-0.0556*** (0.0014)	-0.1862*** (0.0132)	-0.1109*** (0.0088)	-0.0548*** (0.0026)	-0.0732*** (0.0031)
55-64	-0.1883*** (0.0098)	-0.1554*** (0.0064)	-0.0481*** (0.0015)	-0.0632*** (0.0014)	-0.3490*** (0.0156)	-0.1940*** (0.0100)	-0.0589*** (0.0026)	-0.0872*** (0.0031)
constant	0.2371*** (0.0172)	0.1875*** (0.0093)	0.09873*** (0.0027)	0.1114*** (0.0019)	0.4745*** (0.0186)	0.3411*** (0.0125)	0.07287*** (0.0033)	0.1040*** (0.0037)
N	138887	290527	1495849	2805016	51608	117308	490094	873161
R-sq	0.0452	0.0635	0.0131	0.0192	0.0771	0.0972	0.0126	0.0225

Background slides

Worker flows and reforms

Table 10: Impacts of non-linear growth effects and institutional rigidities on worker flows (euro area countries)

EA countries	2000-2015 U-E	2000-2015 E-U	2000-2015 U-E	2000-2015 E-U	2000-2015 U-E	2000-2015 E-U
GDP growth (t-1)	0.0478*** (0.0054)	-0.0015** -0.0003	0.0571*** (0.0038)	-0.0036*** (0.0005)	0.0483*** (0.0036)	-0.0033*** (0.0005)
GDP growth (t-1)*crisis	-0.0592*** (0.0103)	0.0044** (0.0014)	-0.0824*** (0.0061)	0.0027** (0.0009)	-0.0671*** (0.0057)	0.0024** (0.0008)
crisis	-0.0699*** (0.0100)	0.0001 (0.0013)	-0.0745*** (0.0076)	0.0036*** (0.0010)	-0.0629*** (0.0074)	0.0034*** (0.0010)
GDP growth (t-1)*pre-crisis	-0.0417*** (0.0040)	0.0017*** (0.0004)	-0.0346*** (0.0029)	0.0022*** (0.0003)	-0.0377*** (0.0029)	0.0020*** (0.0003)
pre-crisis	0.1106*** (0.0063)	-0.0153*** (0.0008)	0.1180*** (0.0064)	-0.0159*** (0.0008)	0.1062*** (0.0058)	-0.0164*** (0.0007)
GDP growth (t-1) ²	0.0014 (0.0007)	-0.0009*** (0.0001)	0.0019*** (0.0003)	-0.0005*** (0.0000)	0.0011*** (0.0002)	-0.0001*** (0.0000)
EPL (t-1)	-0.2005*** (0.0209)	-0.0120*** (0.0029)				
PMR (t-1)			-0.0286*** (0.0035)	-0.0016** (0.0006)		
CCB (t-1)					-0.0486*** (0.0068)	0.0033*** (0.0009)
constant	0.5760*** (0.0248)	0.0933*** (0.0035)	0.2137*** (0.0117)	0.1196*** (0.0020)	0.2761*** (0.0184)	0.1102*** (0.0027)
N	203072	2088705	272002	2667854	272002	2667854
R-sq	0.0484	0.0212	0.0579	0.0200	0.0581	0.0200

Table 11: Impacts of non-linear growth effects and institutional rigidities on worker flows (reforming countries)

Reforming countries	2000-2015	2000-2015	2000-2015	2000-2015	2000-2015	2000-2015
	U-E	E-U	U-E	E-U	U-E	E-U
GDP growth (t-1)	0.1029*** (0.0143)	-0.0124*** (0.0025)	0.0930*** (0.0128)	-0.0075*** (0.0021)	0.0714*** (0.0122)	-0.0052** (0.0020)
GDP growth (t-1)*crisis	-0.1355*** (0.0197)	0.0061 (0.0038)	-0.1065*** (0.0160)	0.0002 (0.0030)	-0.0744*** (0.0154)	-0.0027 (0.0028)
crisis	-0.0630*** (0.0133)	0.0053** (0.0020)	-0.0467*** (0.0127)	0.0029 (0.0019)	-0.0377** (0.0127)	0.0040* (0.0019)
GDP growth (t-1)*pre-crisis	-0.0286*** (0.0080)	0.0031** (0.0010)	-0.0288*** (0.0081)	0.0024* (0.0011)	-0.0243** (0.0079)	0.0025** -0.0006
pre-crisis	0.06673*** (0.0095)	-0.0129*** (0.0013)	0.0854*** (0.0101)	-0.0128*** (0.0014)	0.0599*** (0.0096)	-0.0119*** (0.0013)
GDP growth (t-1) ²	-0.0001 (0.0008)	-0.0016*** (0.0001)	-0.0006 (0.0005)	-0.0007*** (0.0001)	0.0006 (0.0005)	-0.0008*** (0.0001)
EPL (t-1)	-0.2409*** (0.0214)	-0.0522*** (0.0126)				
PMR (t-1)			-0.0344*** (0.0045)	-0.0016** (0.0003)		
CCB (t-1)					-0.0652*** (0.0085)	0.0072*** (0.0012)
constant	0.6302*** (0.0261)	0.0804*** (0.0040)	0.4381*** (0.0159)	0.0901*** (0.0028)	0.5977*** (0.0324)	0.0645*** (0.0049)
N	79970	647934	123230	1031656	123230	1031656
R-sq	0.0886	0.0242	0.0956	0.0228	0.0966	0.0229