

INTERNATIONAL MONETARY FUND

Cross-Cutting Themes in Employment Experiences during the Crisis

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October 8, 2010

The human cost of the recent global crisis is reflected in its impact on the labor market. Explaining why economies with similar downturns had very different employment trends can help design policies to reduce such costs and improve labor markets.

This paper analyzes the recent employment experiences of six economies: Germany, Korea, Mexico, New Zealand, Spain, and Sweden. These economies represent a wide range of labor market institutions, policy responses, and outcomes to the crisis.¹

The divergence of labor market outcomes and of the effectiveness of policies during the crisis can be explained by the interaction between the nature of the shocks and differences in the structure and institutions of each country's economy. The worst job losses compared to the drop in output followed permanent shocks, particularly in dual labor markets and in the presence of wage rigidities. Policies to avoid job cuts were much more effective when they were well-targeted and responded to temporary shocks. In contrast, policies to facilitate labor movements were more appropriate following permanent shocks.

The analysis suggests a number of policy implications:

- *Policies to support employment are justified during severe downturns but have to be tailored to the expected duration of the shock and the institutions in place.*
- *Policies are also justified to avoid an increase in long-term unemployment and a drop in labor force participation during severe downturns.*
- *Reforms to reduce employment protection gaps in dual labor markets could lead to smoother labor market adjustments, both by avoiding strict protection for regular contracts and abuse of temporary employees.*
- *Wage setting mechanisms work best when allowing adjustment via centralized coordination for economy-wide shocks and firm-level bargains for specific ones.*
- *Crisis-driven labor market policies should give their place to broader structural reforms in the medium term.*

¹The paper reflects key insights from meetings with the private and public sectors in missions to Korea, New Zealand, and Spain, videoconferences with authorities in Germany and Mexico, and written inputs provided by the Swedish authorities.

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I. INTRODUCTION¹

1. **The human cost of the recent global crisis is reflected in its impact on the labor market.** With 210 million people currently out of work worldwide, official unemployment has reached its highest level in history. The human impact in terms of persistent loss of earnings, skill erosion, and reduced life expectancy can be substantial.² Understanding the different labor market experiences of countries during the crisis can help design better policies to reduce some of these costs and improve labor markets looking forward.

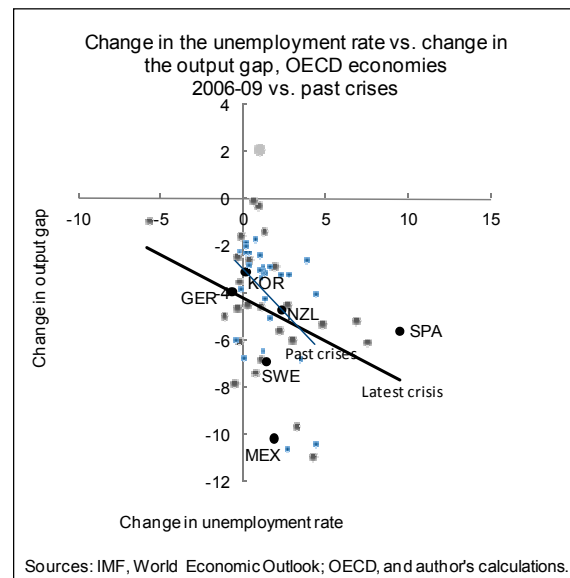
2. **The dispersion of labor market outcomes for a given drop in output has been much larger in this crisis than earlier ones.**

The degree of output contractions during the crisis differed considerably and so did the increase in countries' unemployment rates. However, labor market responses this time around have been larger than in the past, and deviated far more from an estimated negative relationship between the severity of the recession and the increase in unemployment.³ As economies with similar downturns had very different labor market outcomes, the collapse of growth during the crisis cannot fully explain the differences in labor market performance.

3. **To look into the role labor market policies have played in this outcome, this paper analyzes the experiences of six**

economies: Germany, Korea, Mexico, New Zealand, Spain, and Sweden. These economies were hit by different shocks and experienced various ranges of contraction during the crisis. Spain had the worst employment performance among OECD economies during the crisis, while Germany had the best. Furthermore, Spain was hit primarily by domestic

The dispersion of labor market outcomes for a given fall in the output gap has been much larger in this crisis than in earlier ones.



¹This report was prepared by a team comprising Reginald Darius, Mwanza Nkusu, Alun Thomas, Edouard Vidon, and Francis Vitek, led by Athanasios Vamvakidis under the supervision of Tamim Bayoumi and Martin Mühleisen (all SPR). Tola Oni (SPR) provided able research assistance.

²The human costs of the job crisis following the global financial crisis and policies to address them were analyzed during a Joint ILO-IMF Conference in Oslo, Norway (September 13, 2010). For details see: Dao and Loungani (2010), "The Human Cost of Recessions and Crises: Assessing It, Reducing It," Background Paper for the IMF/ILO conference in Oslo, September 13, 2010. Also, see <http://blog-imfdirect.imf.org/2010/09/14/saving-the-lost-generation/> and <http://www.osloconference2010.org/>

³Past crises are defined as in Annex 2.

shocks, whereas Germany by external shocks. The other countries represent interesting cases between these two extremes: New Zealand as an advanced economy that was hit by multiple external shocks; Mexico as an emerging economy that was also hit by multiple external shocks; Korea as a case of a fast recovery following external shocks; and Sweden as a case of financial sector external shocks.⁴ (For the coverage of labor market issues and policies in recent IMF country reports for these countries see Box 1.)

4. **The selected countries represent a large range of institutions** (see Annex 1.)⁵ New Zealand has the least regulated labor market, Spain and Mexico the most regulated. Germany, Korea and Sweden are in between.⁶ Employment protection is relatively strict in Spain and Mexico, but rigid permanent employment coexists with flexible temporary employment in the former, while rigid formal employment coexists with flexible informal employment in the latter. Wage setting mechanisms are the most rigid in Spain (Box 2). Spain and Mexico also stand out with bottlenecks in other structural areas. Structural rigidities are also present in Korea, while the other countries are relatively less hampered.

⁴While Spain and Germany are obvious candidates to study, representing both ends of the distribution of labor market outcomes, Mexico is a unique case, given its high exposure to the US economy. Korea, New Zealand and Sweden are representative cases, in terms of both the shocks that they experienced during the crisis and the shock absorbing mechanisms. The findings of this paper may not necessarily apply to lower-income economies.

⁵International comparisons of labor market institutions are subject to a number of caveats. Survey-based evidence may be affected by ideological priors, while labor market outcomes may be only partly driven by institutions. Moreover, different indicators can give conflicting results. To address these issues, a variety of indicators from alternative sources is used to assess labor market institutions.

⁶Based on pre-crisis indicators, Germany's labor market would have been flagged as highly rigid. However, the assessment of rigidities has been revised over the course of the crisis. In particular, the latest vintage of World Economic Forum survey indicators shows improvement in "hiring and firing practices", "cooperation in labor-employer relations", and the perceived link between pay and productivity.

Box 1. Coverage of Labor Markets Issues and Policies in IMF Country Staff Reports Following the 2008 Global Crisis

The coverage of labor market issues and policies in recent IMF country staff reports has increased in most cases since the onset of the global crisis. The discussion is consistent with the key results of this report, linking the considerably different labor market outcomes to differences in each country's cycle and the country-specific shocks, the existing institutions and policies to support employment.

- The discussion in the 2010 report for **Germany** focuses on explaining why unemployment did not increase during the crisis. This is attributed to an improved underlying employment trend owing to earlier reforms, as well as to crisis-driven policies, such as enhancement of government subsidies for short-time employment and stimulus measures to support the corporate sector.
- The 2009 and 2010 reports on **Korea** include policy advice to increase labor market flexibility and rebalance growth towards nontradables. The discussion covers the 2009 measures to support employment. However, it points to remaining rigidities and argues for reforms that would reduce the gap in employment protection between regular and nonregular employment—by reducing it for the former, while strengthening social protection programs—promote small and medium-size enterprises, and facilitate a reallocation of employment towards nontradables. The advice is bolstered by an analytical chapter in the 2010 Selected Issues Paper on the impact of employment protection on labor dynamics.
- For **Mexico**, the discussion in the 2010 Staff Report included a Selected Issues Paper focusing on structural impediments stemming from the high level of informality. The report also alluded to a developing social consensus on reforms that should increase labor market flexibility.
- The 2009 and 2010 reports for **New Zealand** did not cover labor market issues.
- The 2010 report for **Spain** includes a substantive analysis of labor market issues and an analytical background paper. The discussion covers reforms since the 1980s, including the June 2010 reforms, cross-country comparisons, and estimates from an econometric model of the determinants of unemployment. The analysis examines the factors behind the observed labor market deficiencies and sheds light on policies that could help reduce the underlying unemployment rate, as well the large share of temporary employment.
- The 2010 report for **Sweden** includes a discussion of recent labor market developments and reforms. The report also includes a description of policy actions compared with OECD recommendations. A more detailed background note on labor market developments includes cross-country comparisons and a panel econometric analysis.

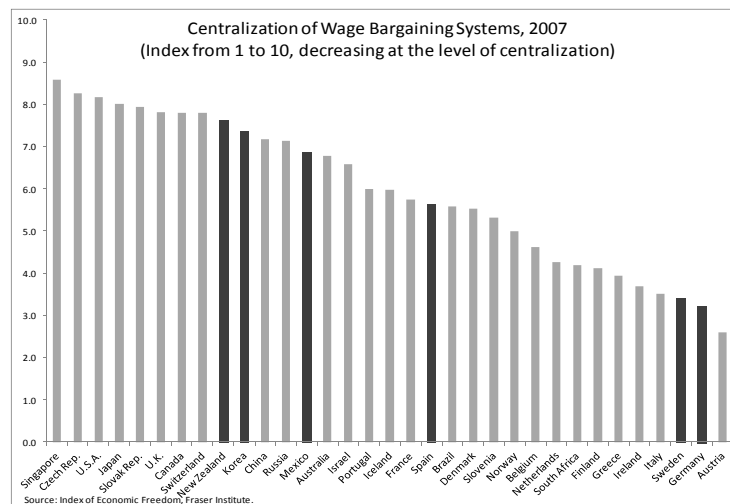
Box 2. Employment and Wage Setting Rigidities

All countries in the sample but New Zealand are flagged for employment rigidities (see Annex 1 for detailed indicators.) This is particularly the case for Germany, Spain and Mexico, which exhibit high employment protection and high redundancy costs. Firing costs are also high in Korea. Individual dismissal of permanent employees is relatively easy in New Zealand, while collective dismissals are relatively easy in New Zealand and Korea. Although temporary employment is in some cases highly regulated, its protection is usually substantially lower than for regular employment, resulting in dual labor markets, particularly in Spain and Korea. Mexico's rigidities have exacerbated the large informal sector—currently over half of employment.

Wage setting differs substantially in the sample, but is the most rigid in Spain.

- Tax wedges on labor income are high in Germany, followed by Spain and Sweden.
- Wage bargaining is centralized in Germany and Sweden. It is decentralized in nonunionized sectors in New Zealand, Korea, and, to a lesser extent, Mexico. Spain has an intermediate level of coordination in wage bargaining (at the province and industry level). The degree of unionization can affect the coverage of collective bargaining directly (Korea and New Zealand), or not at all (Germany and Spain).
- Wage setting takes place against cooperative labor-employer relations in Sweden, New Zealand, and Germany.
- The minimum wage is relatively high in New Zealand, followed by Spain. Germany has no statutory minimum wage.
- Employee compensation is the most linked to productivity in New Zealand and Korea—seniority-based wage setting is also prevalent in the latter. This link has improved in Germany, but not in Mexico and Spain (due to wage indexation in Spain).

Wage bargaining mechanisms differ substantially in the sample.

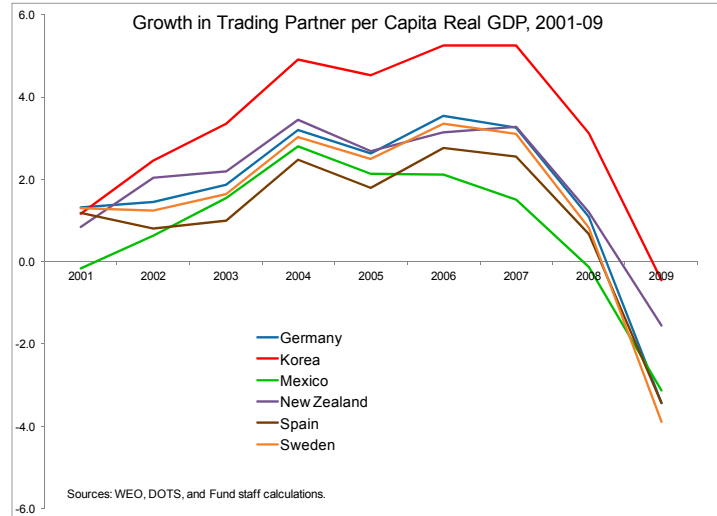


II. THE FACTS

A. Country-Specific Shocks

5. **Although the recent crisis was global, its impact on countries differed substantially and was transmitted through different channels.** External demand declined throughout, as trading partner growth collapsed. However, the crisis-induced collapses in asset prices and trade flows reduced domestic and external demand to varying degrees across different countries (Figure 1). In some cases, the shocks took primarily the form of substantial output drops in specific domestic sectors and were often perceived as permanent changes (particularly in construction), while in others it reflected more temporary drops in domestic or external demand for easily postponed purchases—investment goods and consumer durables.

External demand declined throughout, as trading partner growth collapsed.



6. **In this context, country experiences during the crisis can be separated into permanent (persistent) and temporary shocks.** Permanent shocks were represented by the bursting of property bubbles and the required adjustment of over-extended balance sheets, while temporary shocks reflected the collapse of external demand and external financing constraints. The former is most evident in employment in construction, while the latter mainly affected employment in manufacturing (see text table.)

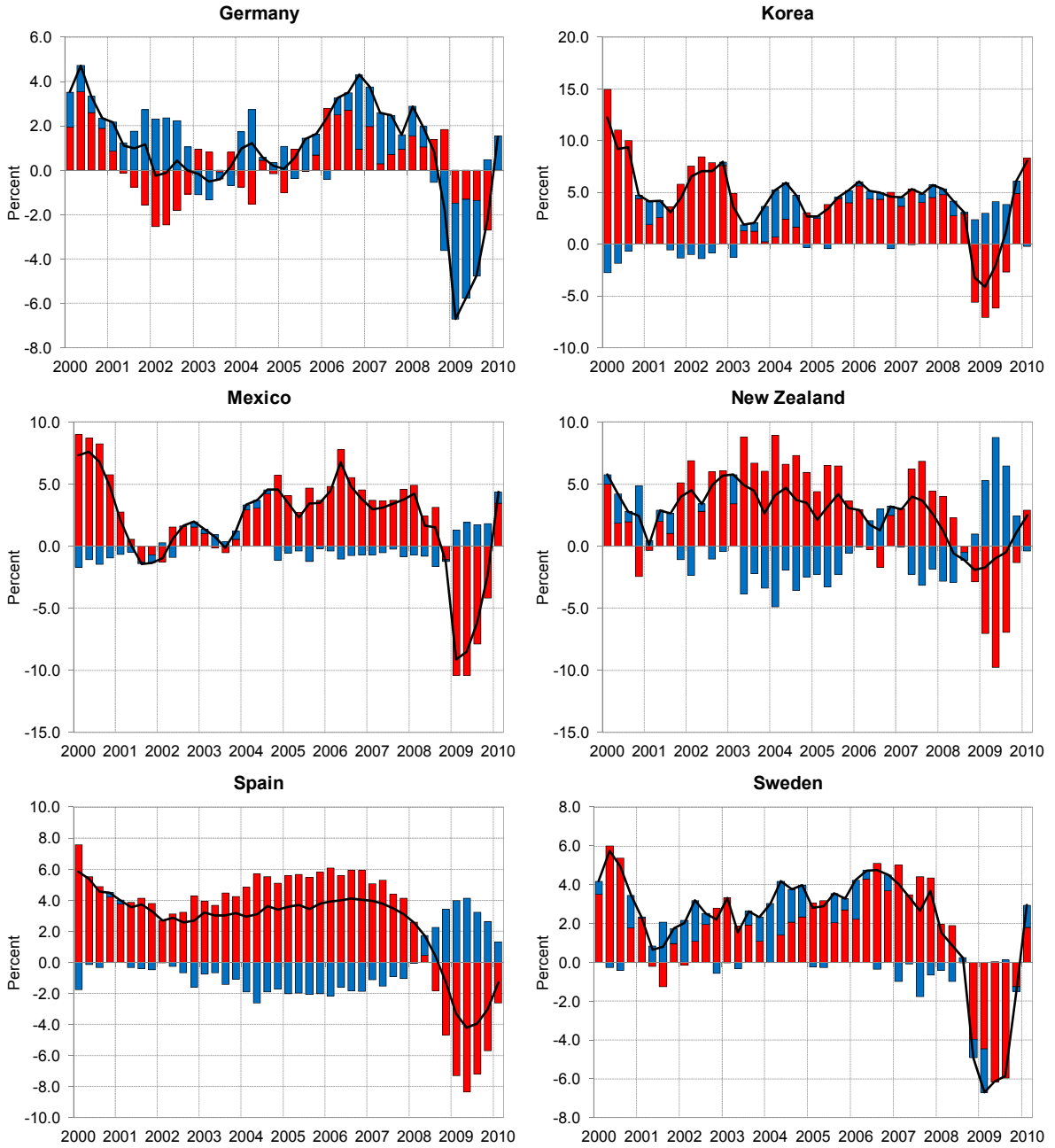
Employment Growth Across Industry 1/
(In percent per annum)

	Agriculture	Industry (non-manuf.)	Industry (manufacturing)	Construction	Trade	Finance and Real Estate	Other Services
OECD							
2000-09	-1.4	0.4	-0.8	2.1	1.4	3.2	2.0
2009	-2.1	-1.2	-6.1	-7.1	-2.2	-2.1	1.4
Germany							
2000-09	-1.1	-2.4	-0.6	-2.9	0.5	2.8	1.0
2009	0.6	-2.0	-2.8	0.3	0.3	-1.2	2.0
Korea							
2000-09	-3.4	3.6	0.1	4.5	0.3	5.7	4.9
2009	-2.7	5.7	-6.2	-3.4	-5.2	-5.8	14.6
Mexico							
2000-09	-3.1	2.9	0.2	3.4	4.6	6.9	1.4
2009	3.1	-2.8	-9.7	-10.1	-1.1	-1.5	2.8
New Zealand							
2000-09	0.3	2.7	0.2	5.8	2.0	4.1	2.2
2009	-21.2	6.7	-7.6	-7.7	-1.3	-0.1	3.4
Spain							
2000-09	-1.8	8.0	0.2	4.4	3.7	5.7	3.2
2009	-3.4	7.8	-15.9	-26.4	-6.2	-4.2	1.6
Sweden							
2000-09	-2.5	0.6	-1.2	3.2	0.9	3.3	0.9
2009	-1.7	0.7	-10.6	-1.2	-1.5	1.5	-0.6

Notes: 1/ Bold values indicate significance at the 5 percent level relative to the aggregate industry averages.
Source: OECD and Fund staff calculations.

Figure 1. Output Growth Decompositions: 2000–10

During the crisis, external demand collapsed in Germany, while domestic demand collapsed in Spain, with the other countries in between.



Note: Decomposes output growth into contributions from growth in domestic demand and net exports.

Sources: WEO and Fund staff calculations.

- **Germany, Korea, New Zealand and Sweden were hit by temporary external shocks, which, however, affected domestic demand differently.**
 - *In Germany*, the collapse in world demand for manufactured goods, in particular consumer durable and business capital goods, caused a contraction in export demand. Domestic demand was much less affected.
 - *In Korea*, capital outflows associated with the global flight to quality resulted in sharply lower asset prices and initial dislocations in money markets. Moreover, exports collapsed, which quickly spilled over to domestic demand.
 - *In New Zealand*, the collapse of world commodity prices (which exacerbated an earlier drought) led to a substantial drop in agricultural employment, while tighter bank credit as risk adverse foreign lenders unwound carry trade positions reduced private consumption and investment demand.⁷
 - *In Sweden*, concentrated exposures of domestic commercial banks to troubled emerging economies forced credit tightening, reducing private consumption and investment demand, while the collapse in world demand for manufactured goods caused a contraction in export demand and a substantial drop in manufacturing employment.
- **Mexico was hit by multiple external shocks, some of which could prove persistent, depending on the recovery of the U.S. economy.** The most severe shock was in manufacturing and was caused by the U.S. recession. The collapse of world commodity prices, in particular the price of oil, and credit tightening by distressed foreign owned commercial banks magnified the impact of the crisis. External demand dropped substantially, but private consumption and investment demand also contracted.
- **Spain was primarily hit by domestic and permanent shocks.** The bursting of a property price bubble and the credit tightening that followed caused a contraction in private consumption and investment demand.

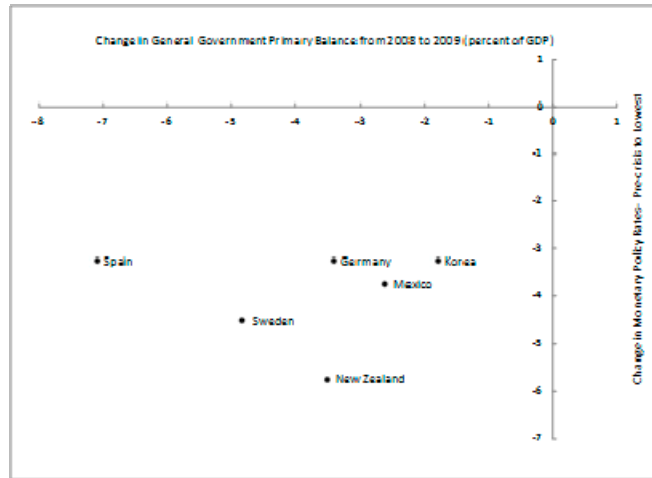
B. The Policy Responses

7. **To their credit, countries responded to the crisis with extraordinary policy measures to shield the labor market.** The fear of a global recession turning into a great depression focused policy minds and often led to “out of the box” policy actions.

⁷New Zealand’s share of employment in agriculture was about 7 percent before the crisis.

8. **Macroeconomic policies were strongly supportive across the board during the crisis.** Extraordinary monetary policy support was implemented as policy rates were cut dramatically (by similar magnitudes, albeit from different starting points) and fiscal deficits increased in all countries.

Macroeconomic policies have been strongly supportive across the board during the crisis.



The fiscal response was largest in the European economies, partly reflecting automatic stabilizers. In Mexico, a strong starting position allowed the government to increase spending in infrastructure investment to stimulate the economy. Korea, which had the smallest fiscal expansion, was the only country in the sample to maintain a primary surplus.⁸

9. **All six countries introduced measures to support employment, particularly active labor market policies (ALMP) and, with Germany in the lead, short-time work schemes** (see text table and Box 3 for more details.)

Active Labor Market Policies During the Crisis

		Germany	Korea	Mexico	New Zealand	Spain	Sweden
Labor demand	Job subsidies, hiring incentives, or PWP ¹		X	X		X	X
	Reduction in non-wage labor costs	X		X	X	X	X
	Short-term work schemes	X	X	X	X		
Measures to help unemployed find work	Activation requirements		X				
	Job search assistance and matching	X	X	X	X	X	X
	Job-finding and business start-up incentives		X	X		X	
	Work experience programs		X		X		X
	Training programs	X	X	X	X	X	X
Other training measures	Training for existing workers	X		X		X	X
	Apprenticeship				X		

Source: OECD.

Note. Measures covered refer only to federal government initiatives. PWP is public work programs. The check marks suggest that discretionary actions were taken in the particular area of ALMP with no indication of the intensity of the actions.

⁸The fiscal data in the text chart are on a GFS2001 basis, which could give different results for some countries (such as Korea) than data on a GFS1986 basis, as policy lending is excluded in the former. The data for Korea covers only the central government.

Box 3. Active Labor Market Policies Introduced in Response to the Recent Crisis

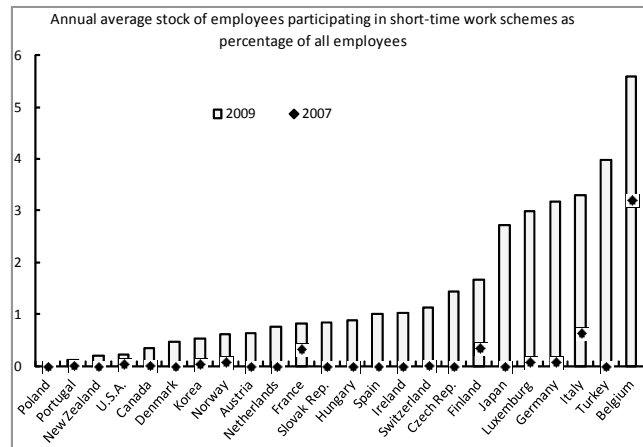
All six economies in the sample have implemented ALMPs following the crisis that fall into two broad categories: measures to sustain labor demand; and measures to improve employment prospects. This box lists these measures by country.¹

1. **Policies to sustain labor demand include public work programs (PWP), job creation subsidies, reduction of nonwage labor costs, and funding for short-time work (STW) schemes.**
 - **Germany:** (i) reduction in 2009–10 of employer and employees unemployment insurance contribution rates; (ii) easing of the eligibility for STW schemes by simplifying procedures; (iii) extension of allowance for STW to temporary agencies' workers up to end-2010; (iv) extension of the maximum duration of STW from 6 months to 2 years; and (v) new subsidized training for STW.
 - **Korea:** (i) temporary expansion of public sector job creation schemes; (ii) youth internship program for SMEs with wage subsidies for hiring interns at the end of the internship; (iii) easing of the eligibility for STW schemes by reducing the proportion of workers to be reassigned and the minimum training hours to be eligible for STW subsidy; and (iv) increased employer subsidy for STW.
 - **Mexico:** (i) partial reimbursement of employer social contributions for new employees registered for social security in 2009; (ii) broadening of the temporary PWP to cover all municipalities; (iii) a 50 percent increase in the allowed maximum number of days for temporary work; and (iv) temporary introduction of STW subsidies to support working hours' reductions negotiated by social partners.
 - **New Zealand:** (i) permanent reduction in mandatory employer retirement savings contribution and reduction in employee minimum contribution—also motivated by concerns about cost-effectiveness of the savings incentives; and (ii) introduction of a temporary job scheme to support voluntary working hour reductions negotiated between social partners in some sectors.
 - **Spain:** (i) reduction in employer social contribution for the first two years for new employees; (ii) reduction of social contributions for youth and the disabled who start up businesses; (iii) funding for PWPs; and (iv) extension of subsidies for hiring part-time workers to those on STW schemes.
 - **Sweden:** (i) deferment of two months of employer 2009 social security contributions and taxes until January 2011; and (ii) permanent increase in hiring subsidy for recruitment of newly-arrived immigrants and those who have been unemployed or sick for more than a year. Shortened qualification period for hiring subsidy from one year to six months for elderly unemployed.
2. **Policies to improve employment prospects for existing workers and those out of work**
 - **Germany:** (i) additional public employment services (PES) staffing to improve job search assistance; and (ii) increased funding for training, including for the unemployed.
 - **Korea:** (i) increase in PES staffing and expanded use of private employment agencies; and (ii) increased funding for expansion of training places for the unemployed.
 - **Mexico:** increased funding for PES, including job search assistance and job matching.
 - **New Zealand:** (i) redeployment of PES staff to increase job search assistance; (ii) partnerships with employers to provide training and job placement for low-skilled youth; and (iii) jobs and youth opportunities programs (wage subsidies and training for youth at risk of long-term unemployment).
 - **Spain:** increased funding for PES for job search assistance, training, and vocational education.
 - **Sweden:** (i) increased resources for PES to expand job search assistance; (ii) increase in the number of job placement schemes for the unemployed, (iii) funding for practical skills development for the unemployed with previous experience and increased financial aid for those who start training, and (iv) temporary regular education and training initiatives (adult vocational training/adult education, vocational colleges and universities and colleges).

¹For more details, see OECD (2009).

- The use of short-time work schemes aimed at preserving human capital varied substantially. These schemes operated through subsidies to firms for parts of the wage bill, sometimes combined with support for on-the-job training for employees (e.g., Sweden). In Germany, where coverage of already existing schemes and the duration of benefits and subsidies were extended, participation was substantial, following firm-level agreement between management and work councils.⁹ Elsewhere, participation in such schemes was more limited.¹⁰

Short-time work schemes were introduced or extended in all countries, but their actual use varied substantially.



Source: OECD Employment Outlook, 2010.

Note: until 2009 Q3 for Austria and the Netherlands; August 2009 for Portugal and Spain; September 2009 for the Slovak Republic; and October 2009 for Luxembourg and New Zealand.

- Some countries focused on preserving labor force participation and avoiding an increase in long-term unemployment. Korea, for example, introduced in 2009 a program of short-term employment in the public sector for older and long-term unemployed (“Hope Work Program”). Mexico also expanded existing programs for short-term public sector employment in infrastructure programs.¹¹
- Sweden temporarily eased eligibility for unemployment benefits, while in Spain this was combined with a permanently increased duration. New Zealand increased social assistance for the unemployed.
- Training and job matching programs were expanded in all countries.

⁹Short-time work schemes existed in Germany long before the recent crisis, but were made more generous in 2008–09, reaching 1.5 million workers at their peak. The government provided up to 67 percent of former wages to employees who had agreed with their employers to cut working hours, partially or completely, for up to 2 years (extended from 6 months initially). Although such schemes subsidized labor hoarding, they did not eliminate costs to firms, thus providing an incentive for firms to exit if/when the shock threatened to last longer.

¹⁰Korea also used short-time work schemes—with the government temporarily subsidizing up to 70 percent of the wages of redundant workers retained by firms. Authorities’ data suggest that in Mexico about 250,000 workers benefited from such schemes in 2009.

¹¹In 2009, such programs benefited up to 250,000 people in Korea and 700,000 people in Mexico, according to the authorities’ data.

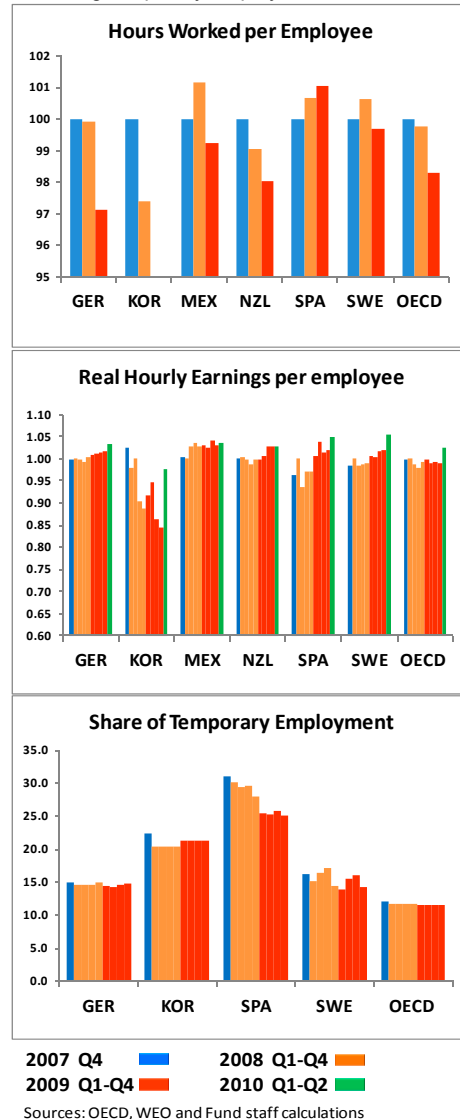
C. The Labor Market Outcomes

10. Employment trends varied considerably during the crisis (Figure 2).

Employment dropped the most in Spain, while it remained almost flat in Germany and has already recovered to pre-crisis levels in Korea and Mexico. The unemployment rate rose substantially in Spain, while it declined slightly in Germany. It increased in all other countries, although considerably less than in Spain and from much lower levels. A decomposition of employment changes suggests that: all countries but Germany had growth in the working age population; changes in labor force participation were relatively minor; and the employment rate declined throughout, with the exception of Germany and Korea (Box 4).

11. **These employment trends are partly explained by the extent to which hours worked adjusted downward.** As demand collapsed, hours worked per person dropped in most countries, which helped avoid excessive job losses.¹² The drop was more pronounced in Germany, Korea and New Zealand. In Germany, the drop in hours worked reflected labor market policy schemes (as discussed above), while in New Zealand it followed primarily firm-level agreements between employers and employees, with Korea an intermediate case, depending on the sector.¹³ Spain was the only country in which hours worked per worker increased, despite

Countries absorbed shocks by controlling labor costs, reducing working hours per employee, or reducing temporary employment.

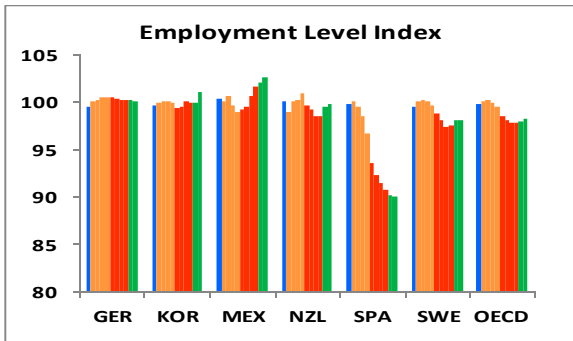


¹²There was already a downward trend of hours worked before the crisis, because of increasing female labor force participation and, in some cases, part-time employment.

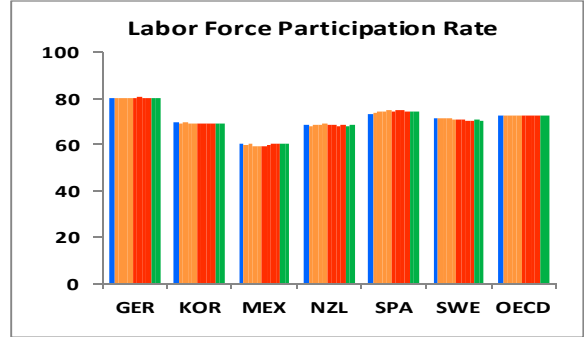
¹³Although the government in New Zealand introduced a scheme to reduce working hours, it was hardly used in practice. Flexible labor markets and a tradition of firm-level negotiations and excellent relations between social partners led to agreements relatively early in the crisis to reduce working hours, in order to avoid severe job losses during what was expected to be a temporary downturn. The government's role was primarily limited to moral suasion on the need to reduce labor costs without employment cuts—including during a job summit in early 2009, which also helped coordinate social partners.

Figure 2. Trends in Selected Labor Market Indicators: Quarterly Data, 2007Q4–2010Q2

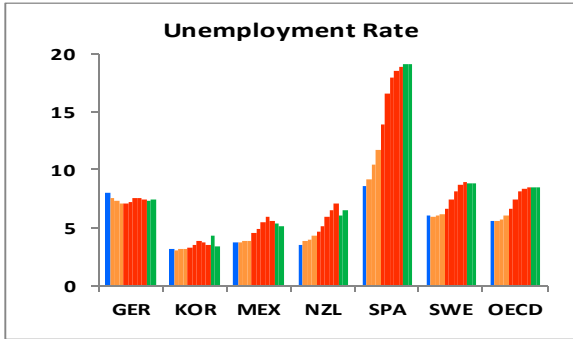
Employment trends varied considerably during the crisis.



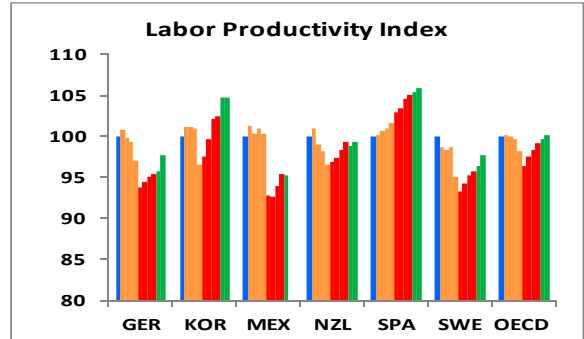
Trends in labor force participation were more similar across countries, with overall participation remaining broadly flat.



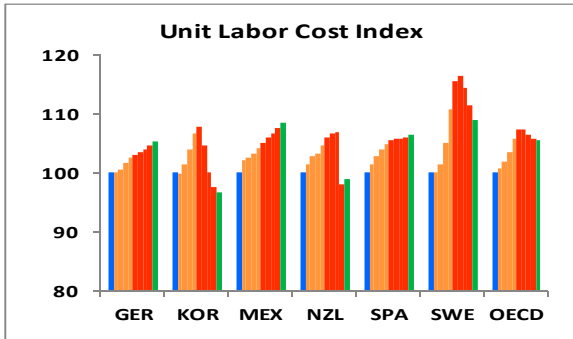
With stable labor force participation rates, unemployment trends reflected mostly changes in employment.



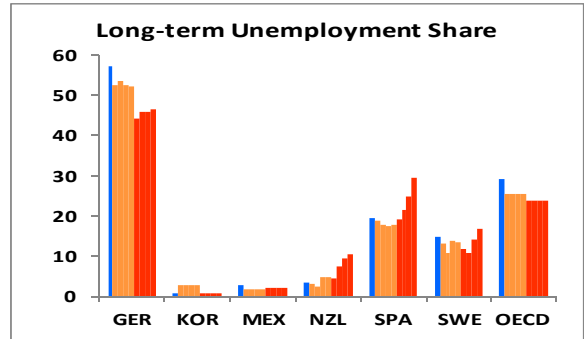
Labor hoarding and the collapse in output led to a drop in labor productivity...



...and an increase in unit labor costs.



It is still too early to determine the full response of long-term unemployment to the crisis.



2007 Q4 ■ 2008 Q1-Q4 ■ 2009 Q1-Q4 ■ 2010 Q1-Q2 ■

Sources: OECD, WEO, and Fund staff calculations.

Box 4. Employment Decomposition

To explain what drove employment trends in the sample during the recent global crisis, employment changes are decomposed in movements in the employment rate, the labor force participation rate, and working age population:

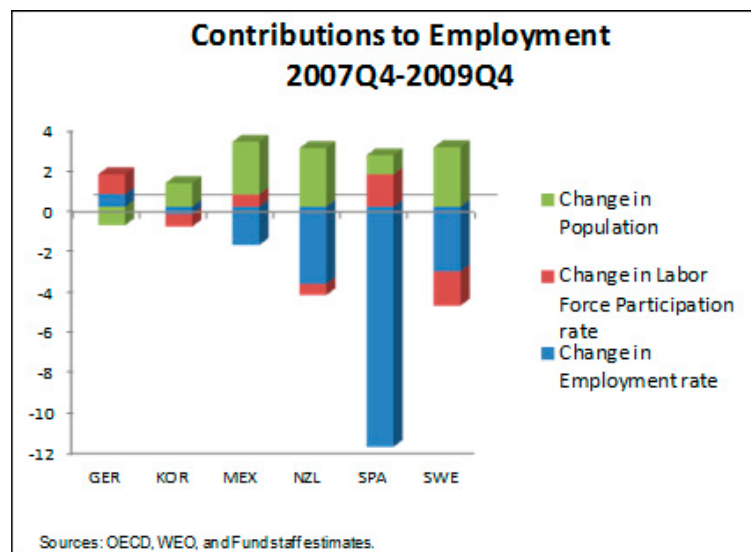
$$(dE / dt) / E = (d(E \text{ rate})/dt)/(E \text{ rate}) + d(L \text{ rate})/dt/(L \text{ rate}) + (dP/dt) / P$$

where E is employment, L is the labor force, and P is the working age population; the time period is 2007Q4 to 2009Q4.

The contributions to the employment changes during the recent crisis are the following:

- All countries but Germany benefited from a positive contribution from growth of the working age population, ranging from 1 percent in Spain and Korea to almost 3 percent in New Zealand and Sweden.
- The changes in labor force participation were relatively small. Participation increased in Spain, Mexico and Germany, but fell in the other countries.
- The employment rate declined throughout, with the exception of Germany and Korea.

Therefore, while the labor force participation rate and demographic changes provided positive contributions to employment in Spain, the decline in its employment rate more than offset these trends. In Germany, the increase in the employment rate drove employment, while for most of the other countries the change in the employment rate was partly offset by changes in the other determinants. In Mexico, the employment rate fell by 2 percentage points, while employment rose by 1 percent driven by positive contributions from changes in labor force participation and the population.



government subsidies for short-time work programs.

12. **Restraining wages could have also played a key role.**¹⁴ Korea showed exceptional downward wage flexibility. In contrast, wages rose in Spain despite the severity of the recession, driven by backward and asymmetric wage indexation in 2009, in response to the precrisis oil price shock, and rigidities resulting from an intermediate (industry-level) wage bargaining system.¹⁵ Real wages were kept broadly constant during the crisis in the other economies—but have started rising more recently. However, downward flexibility may have been obscured in some cases by compositional effects.¹⁶

13. **In countries with a large share of temporary employment, such contracts absorbed most of the shocks.** This was particularly the case in Spain, where the share of temporary employment was the highest and fell the most. Although such contracts may have allowed a fast adjustment in sectors hit by permanent shocks, they also led to large overall employment losses by reducing the role of other shock absorbing mechanisms. The large disparity between regular and temporary contracts turned the latter into the weak link of the labor market during the crisis. Temporary employment also fell in Korea and Sweden, although from lower levels.¹⁷

¹⁴Although it does not apply in the countries under consideration, wage moderation may not always be desirable in the presence of deflationary pressures.

¹⁵Spain's asymmetric wage indexation formula explains why wages did not fall in response to lower oil prices at the peak of the crisis. However, public sector wages have recently been reduced by 5 percent, which could also affect private sector wage settlements.

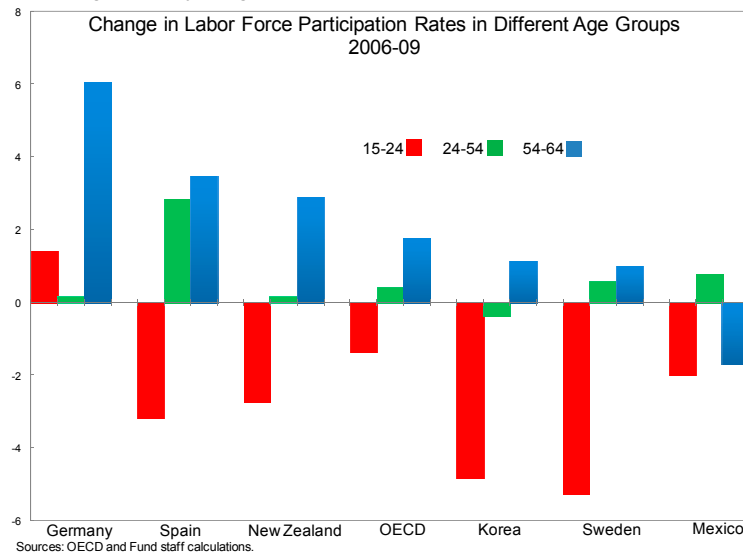
¹⁶In New Zealand, the authorities' analysis suggests that the actual wage adjustment has been larger than that implied by simple averages, because the share of employment in industries with relatively high wages has increased. In addition, to the extent that less productive employees are fired first during a downturn, changes in average wages may reflect composition changes in terms of productivity.

¹⁷Authorities' estimates suggest that about 80 percent of the jobs lost in Spain during the crisis have been for temporary contracts. Although Korea's precrisis share of temporary employment and its adjustment during the crisis were smaller, authorities' estimates suggest that almost all job losses were for temporary employees.

14. Labor force participation has been broadly flat across all countries, but the composition of the labor force has been changing.

- Although labor force participation is usually weakly procyclical, this has not been the case during this crisis. Labor force participation has remained broadly flat in most countries, with the exceptions of Germany and Spain, where it has slightly increased.

Labor force participation rates have been increasing for the old and dropping for the young.



- Labor force participation has increased for the old and dropped for the young, broadly offsetting each other. Older people may have postponed retirement as the value of their pension funds declined, or may have rejoined the labor market to take advantage of crisis-driven government programs to reduce long-term unemployment.¹⁸ Younger people may have been discouraged from entering the labor market, or simply gone back to school—clearly, the two have opposite implications for human capital accumulation.¹⁹ Exceptions are Germany, where labor force participation increased for all age groups, and Mexico, where labor force participation declined for both the young and the old, but increased for the other groups.

15. Labor hoarding and the collapse in output led to a drop in labor productivity and an increase in unit labor costs. Overall labor productivity fell across the board at the onset of the crisis, although it has recovered since then in some cases. Manufacturing unit labor costs increased in most countries, and particularly in Sweden, followed by Mexico; they have more than recovered in Korea and New Zealand.

¹⁸Labor force participation for people older than 55 was also increasing before the crisis in most OECD economies, most likely because of fast economic growth, but also improving health conditions and pension reforms.

¹⁹In New Zealand, authorities' data suggest that studying accounted for about 72 percent of people between 15 to 24 years old who were not in the labor force.

16. In some cases, exchange rate flexibility and migration flows may have helped absorb the shocks to the labor market.

The exchange rate may have helped absorb shocks in Korea, Mexico, New Zealand and Sweden, where a depreciation took place in real effective terms. In New Zealand, outflows of workers abroad early in the crisis may have reduced the impact of the downturn on unemployment.²⁰

17. It is still too early to determine the full response of long-term unemployment to the

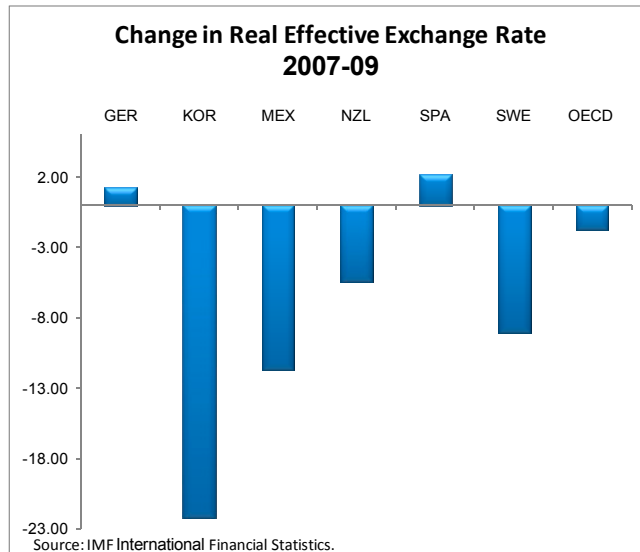
crisis. The share of long-term unemployment usually falls at the beginning of a recession, as lay-offs increase the share of the newly unemployed. However, it eventually increases if the economy fails to start creating new jobs soon. Indeed, Spain seems to have already entered the second phase of this cycle. A similar but less pronounced cycle may be taking place in Sweden and in New Zealand. In contrast, the share of long-term unemployment has fallen in Germany, although from a high level.

D. Comparisons with Past Downturns

18. The labor market experiences of the recent crisis differ considerably from average trends in earlier episodes (Figure 3).

- Output has dropped considerably more in Sweden, Germany, Spain and Mexico, but less in Korea and New Zealand.
- Consistent with the more severe downturn during the recent crisis, the drop in employment has been the most pronounced in Spain compared with previous recessions. Korea is at the other extreme, as job losses during the East Asian financial crisis were substantially larger, reflecting the also larger output losses. Germany also stands out, with more employment losses during past recessions.

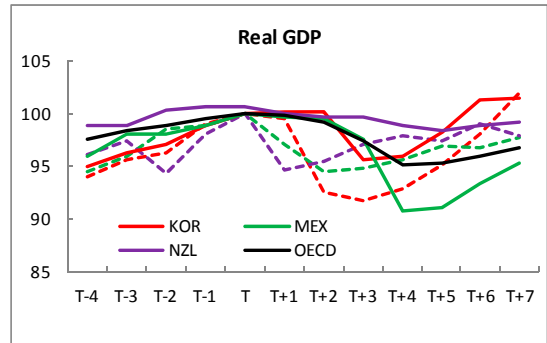
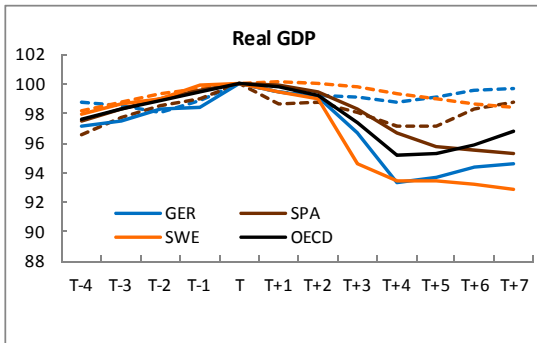
Exchange rate flexibility may have also helped absorb shocks to the labor market.



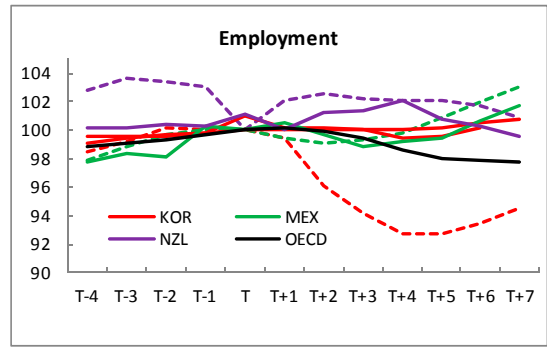
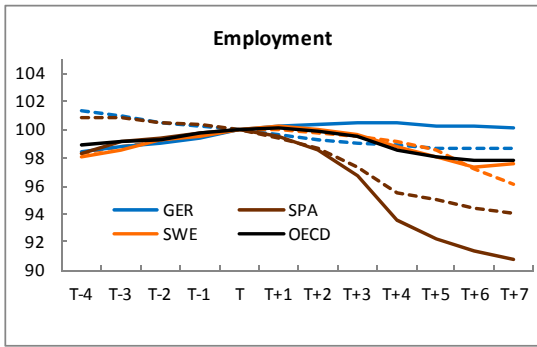
²⁰Although migration to the U.S. helped stabilize Mexico's labor market in past downturns, information provided by the authorities suggests that this was not the case during this crisis.

Figure 3. Output, Employment and the Unemployment Rate: Current versus Previous Cycles 1/
(Quarterly data; current cycle in solid lines, previous cycles in dotted lines)

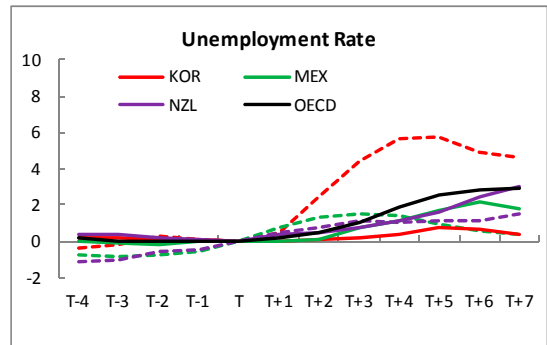
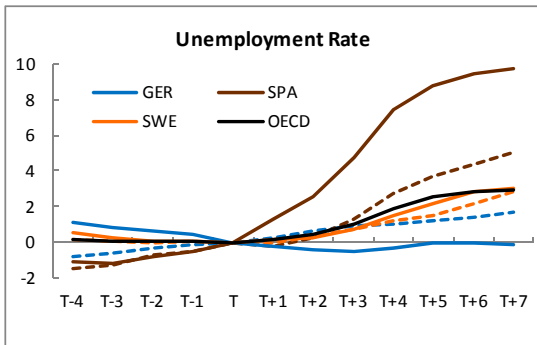
Output has dropped considerably more during the recent recession than in previous episodes in most countries.



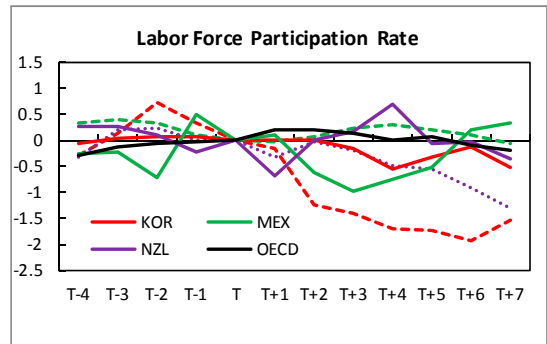
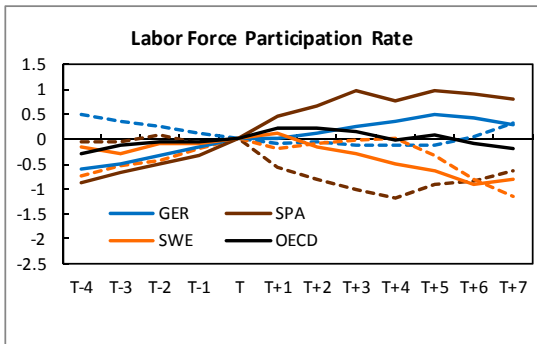
The drop in employment has been the most pronounced in Spain.



Trends in unemployment during the recent crisis have mirrored developments in employment.



Labor force participation has so far been stronger than in past cycles.



Sources: OECD and Fund staff calculations.

1/ T is the peak of the cycle, followed by two quarters of falling real GDP during 1985Q1–2009Q4.

- The unemployment rate has surged in Spain relative to output losses compared to past recessions. In all other cases, the increase in the unemployment rate was less than or similar to that predicted from past recessions—Sweden, New Zealand, and Mexico—or remained almost flat and well below past experience—Germany and Korea.
- Labor force participation has so far been stronger than in past cycles in most countries. As noted above, this reflects higher participation by older age groups.

19. **The changes in the sectoral distribution of employment are similar to those observed during previous crises, with some notable exceptions** (see Annex 2.) Spain is at one extreme, with large cross-sector employment movements, while Germany is at the other, with almost negligible changes. The results are driven primarily by falling employment shares in construction and industrial production (both manufacturing and nonmanufacturing), which in most cases were compensated for by an increase in the employment share of services.

III. MODELING AND EXPLAINING DISPERSED LABOR MARKET OUTCOMES AND ASSESSING POLICY RESPONSES

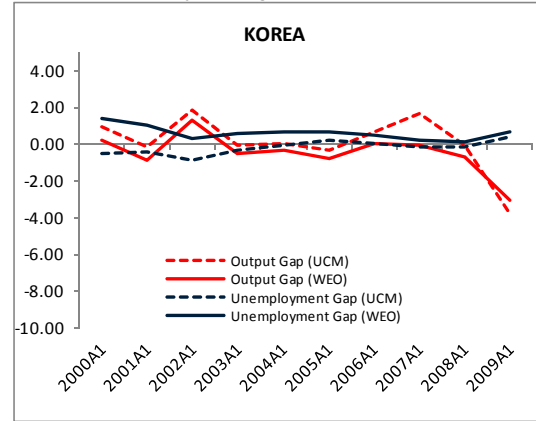
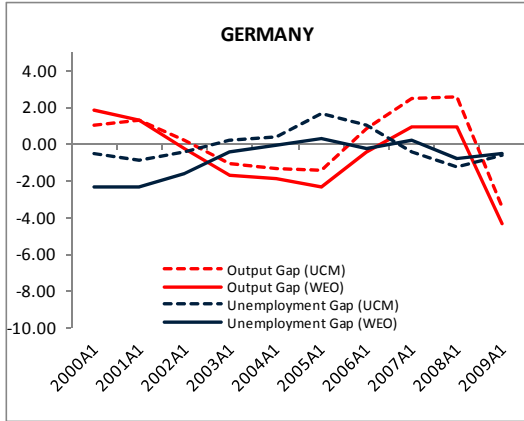
20. **The analysis helps explain the heterogeneous employment outcomes across countries for given output drops and labor market policies.** To a large extent, employment outcomes reflect the choice of labor market adjustment to the negative aggregate demand shock between employment shedding and hours reduction. Institutions and the composition and expected duration of the aggregate demand shock determined this choice. The analysis broadly yields the following results, which are explained in detail further below:

- Estimates from an unobserved components model confirm the substantial cross-country variation in labor market performance during the recent crisis (Figure 4 and Annex 3). Consistent with WEO estimates, output gaps dropped across the board, particularly in Mexico and Spain, while unemployment gaps increased. However, the ratio of the unemployment gap to the output gap varies substantially, from close to 1 in Spain, to slightly negative in Germany.
- Estimates from an econometric model suggest that unemployment has behaved broadly in line with what would have been expected based on the size of the shock, the institutions in place, and labor market policies (Annex 4).²¹
- Empirical evidence using one-digit industry data confirms the link between employment growth and shock absorbing mechanisms that were activated during the

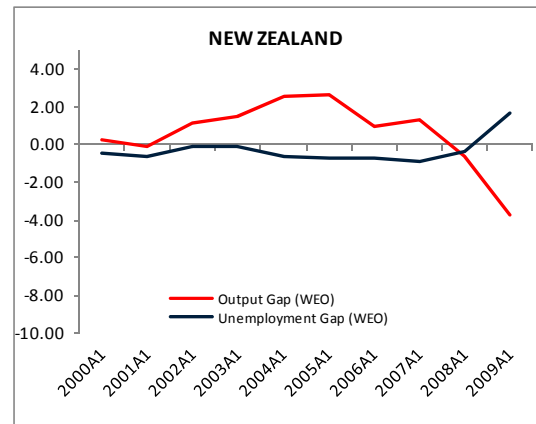
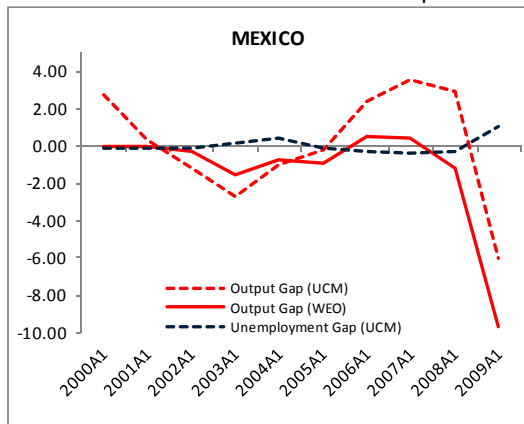
²¹These results are consistent with the findings in IMF, WEO, April 2010, Chapter 3.

Figure 4. Output and Unemployment Gaps: WEO and Estimates from an Unobserved Components Model (In percent)

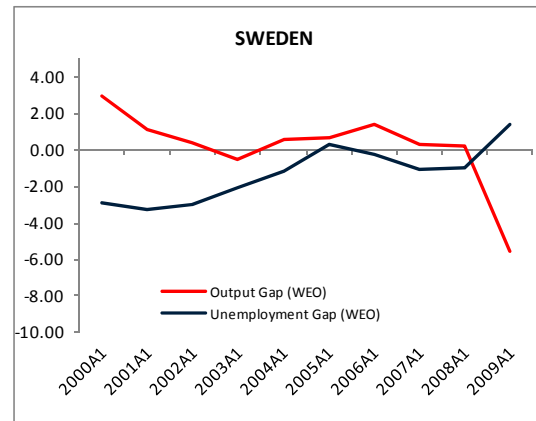
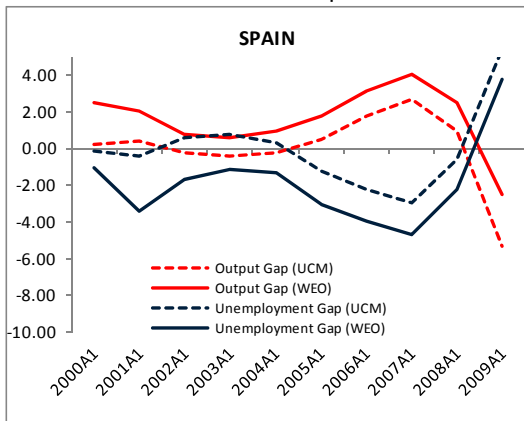
In Germany, the unemployment and output gaps have become asynchronous during the recent cycle while in Korea there has been some upward movement in the unemployment gap.



In Mexico, the movement in the unemployment gap is much less than expected given the change in the output gap, while the relationship is more consistent with Okun's law in New Zealand.



The strongest relationship between the unemployment gap and the output gap is in Spain, while the recent experience in Sweden is comparable to New Zealand's.



Sources: WEO and Fund staff calculations.

crisis, such as adjustment in labor costs, active labor market policies, and changes in the exchange rate (Annex 5).

21. **The role of sectoral shocks is key for understanding how labor market policies affected labor market outcomes.** Taking Spain and Germany as examples, econometric results using country level data and model decompositions cannot fully explain Spain's large unemployment increase and Germany's unemployment drop, despite the introduction of relatively similar labor market policies and the presence of labor market rigidities (less so in Germany) in both countries. However, analysis of industry level data suggests that this difference in labor market outcomes is to a large extent explained by sectoral and permanent shocks in Spain—particularly the large drop in employment in construction, where the share of temporary employment is relatively high—and labor hoarding in response to external but temporary shocks in Germany.

22. **Discussions with the authorities suggest that in countries where the crisis primarily took the form of permanent shocks, only ALMPs that focused on helping the unemployed find new jobs were effective.** This was especially the case when the lost jobs were in sectors that had experienced precrisis bubbles and, therefore, were not expected to return. In contrast, in countries where the impact of the crisis was primarily from external shocks that were perceived to be temporary, schemes to retain employment and avoid large sectoral adjustments, including by reducing working hours, proved to be the most effective. In some countries, such a reduction in working hours was facilitated by state intervention, while in others—with relatively flexible labor markets—it followed agreements between employers and employees.

23. **Analysis also suggests that the effectiveness of labor market policies depended on the institutions in place.** The estimates from the unobserved components model (Annex 3) suggest that countercyclical labor market institutions or policies seem to have offset the transmission of supply shocks to the labor market in most countries, except in Spain. In Spain, domestic labor demand shocks have tended to amplify cyclical fluctuations, suggesting procyclical labor market institutions—for example, the prevalence of temporary employment contracts and wage rigidities—despite the strengthening of ALMPs during the crisis. Indeed, empirical evidence suggests that ALMPs are most effective in creating new jobs in economies *without* strict employment protection for regular employment contracts (Annex 6).

24. **These results suggest that country-specific shocks during the crisis interacted with existing labor market institutions and policy responses to determine the split between job losses and compression of hours** (see Box 5 for a discussion by country.)

Box 5. Shaping Labor Markets Outcomes: Institutions, Country-Specific Shocks and Policy Responses

The labor market outcomes in each country during the recent crisis were determined by the interaction of the country-specific shocks with labor market institutions and policies. The key factor in this interaction was the perceived duration of the country-specific shocks.

- In *Spain*, the shock was domestic, sectoral, and persistent, while the labor market was segmented and rigid; hence, the market adjusted primarily through reductions in temporary employment. Strict employment protection for regular employees, backward and asymmetric wage indexation, and an industry-level wage bargaining system that was not conducive to shock absorption did not allow for other adjustment channels. Labor market policies in response to the crisis proved to be ineffective. Thus, the high share of temporary contracts, particularly in construction, proved to be the labor market's weak link. The drop in employment was substantially more pronounced than the OECD average, particularly in construction and manufacturing.
- In *Germany*, the severe external shock associated with the collapse in world demand for manufactured goods was perceived to be temporary. Policies were well-targeted and focused on avoiding job losses and unnecessary labor market volatility. A key strategy was to retain jobs through subsidizing a reduction in working hours, which seems to have shielded the labor market from the shock, particularly given the centralized wage bargaining system and relatively inflexible working arrangements before the crisis. Indeed, Germany is the only country in the sample where construction employment rose during the crisis, reversing the equally atypical decline in the precrisis period. It is also the only OECD economy where unemployment declined during the crisis.
- In *New Zealand*, the shock was external and perceived as temporary, but affected domestic demand substantially. A flexible labor market and a decentralized wage determination system allowed the activation of multiple shock absorbing mechanisms: wage restraint, declines in hours worked, some increase in unemployment, although from a low level, and exchange rate flexibility. Given a tradition of excellent cooperation between employers and employees, ALMPs focused on improving the flow of information and matching the unemployed with potential job openings, while the reduction in working hours took place primarily through direct negotiations between social partners and firm-level agreements, without extensive use of government subsidies.
- In *Korea*, where the shock was external and temporary, labor markets are segmented but not very rigid, and wage determination is relatively decentralized, the market adjusted primarily through declines in real wages, hours worked and temporary employment cuts. The reduction in working hours took place through both government programs and direct negotiations between employers and employees, depending on the sector. A program to reduce long-term unemployment through short-term government job opportunities also proved effective during the downturn. Employment initially fell in most sectors, with the exception of nonmanufacturing industry and public sector employment, but has fully recovered more recently. In addition to macroeconomic policies and financial sector support measures, exchange rate flexibility may also have supported the economy at the onset of the crisis.
- *Sweden* was affected primarily by external shocks, through both the financial and real sectors. Concentrated exposures of domestic commercial banks to troubled emerging economies forced credit tightening, reducing private consumption and investment demand, while the collapse in world demand for manufactured goods caused a contraction in export demand and a substantial drop in manufacturing employment. Increased labor market flexibility following reforms in the last decade and labor market policies in response to the crisis muted the impact of these shocks. Labor hoarding by firms also played a role, as they expected the shocks to be temporary. Exchange rate flexibility may have also helped absorb the external shocks.
- *Mexico* was hit by multiple external shocks, most of which reflected strong real and financial linkages with the U.S. and were substantial compared with most key emerging market peers. The collapse of world commodity prices and credit tightening by distressed foreign owned commercial banks magnified the impact of the crisis. Mexico's labor market adjusted through a number of channels, but existing rigidities pushed part of the adjustment onto the informal sector—although, according to the authorities' analysis, not as much as in previous downturns. ALMPs were strengthened, but not to the same extent as in some of the more advanced economies. A weakening of the currency may have also acted as a shock absorber.

- Countries where the crisis primarily took the form of permanent shocks—particularly Spain—had worse employment outcomes. This was especially the case when the lost jobs were in sectors that had experienced precrisis bubbles and were not expected to bounce back. In such economies, labor market rigidities became binding. Employment fell regardless of labor market policies, particularly for temporary and/or informal employment, which represented the only flexible parts of the labor market. More recently, ALMPs in such countries have tried to focus on promoting the sectoral reallocation of labor, which could prove more effective.
- Employment outcomes were better in countries where the crisis primarily took the form of temporary external shocks. This was the case in flexible labor markets that allowed the operation of multiple shock absorbing mechanisms—New Zealand—but also in more rigid labor markets that introduced well-designed policies to support employment—particularly Germany. In such cases, schemes to retain employment and avoid large sectoral adjustments were effective. Labor hoarding and a reduction in working hours was facilitated by state intervention, particularly in the presence of labor market rigidities. However, expectations that the shocks would not be persistent also facilitated cooperation among social partners to avoid unnecessary job cuts and restrain wages, which in some cases offset existing rigidities.

25. **Looking forward, concerns over the loss of human capital following a severe crisis may be well-founded and could justify policy intervention** (see Annex 7.) As recoveries do not necessarily create jobs for the long-term unemployed, policy intervention can be effective and help avoid an increase in long-term unemployment. Well targeted labor market policies, such as short-time work and hiring subsidies, can serve such a purpose. However, the above discussion suggests that such policies should be designed to address country-specific shocks, helping retain jobs following temporary shocks, but supporting sectoral employment movements following permanent shocks.

26. **Some countries also seem to be shifting their focus from crisis-response to more fundamental reforms, which could support the labor market in the medium term and promote a more efficient adjustment to future shocks.** Indeed, most labor market policies introduced during the crisis were temporary, and have or are about to expire to avoid creating distortions. Spain has adopted labor market reforms that are expected to reduce the dualism in its labor market and remove some of its wage-setting rigidities (Box 6). And Mexico is currently discussing a proposal for labor market reforms that, if implemented, could bring more flexibility by increasing the number of available contracts and improving the link of wages and promotions to productivity.

Box 6. The Recent Labor Market Reform in Spain

In June 2010, Spain introduced a labor market reform package taking a number of steps to reduce the duality of the labor market and the rigidity of the wage-setting process.

To reduce the duality of Spain's labor market, the reforms have introduced measures to cut dismissal costs for regular employees and limit abuse of temporary employment contracts. Key measures include:

- reducing severance pay for unfair dismissal, by broadening the “contract to promote indefinite hiring” to cover almost all new permanent contracts, and by ensuring that the 33 days severance pay per year of service is the maximum under such contracts— compared with 45 days in regular employment contracts;
- facilitating the financing of part of severance payments by subsidizing 8 days via payments from a newly established fund, to be pre-financed by firms;
- easing the criteria for fair dismissal and limiting severance payment to 20 days per year of service; and
- tightening conditions for temporary contracts, by enforcing a maximum duration (3 years, with the possibility of extending it one more year subject to collective bargaining) limiting successive renewals, and gradually raising severance payments from 8 to 12 days (by 2015).

To reduce the rigidity of the wage-setting process, the reforms have broadened the scope to opt-out of collective wage agreements. In particular, it allows firms without compulsory trade union representation (less than 6 employees) to opt out. Large firms can also opt out if agreed between employers and employees.

Other key aspects of the reform include:

- increasing firm level flexibility, in particular to encourage short-time working plans over lay-offs;
- incentives for the use of “training contracts;” and
- opening labor intermediation more broadly to private agencies.

The reforms have not changed Spain's backward and asymmetric wage indexation, but this is currently being discussed among the social partners.

IV. KEY CONCLUSIONS AND POLICY IMPLICATIONS

27. **Analysis of employment experiences in Germany, Korea, Mexico, New Zealand, Spain and Sweden during the recent crisis suggests a number of policy implications.**

Although drawing general lessons from country case studies is not always straightforward, particularly as the impact of the crisis on labor markets is still in progress in some cases, future studies could analyze these implications further.

- **Policies to support employment are justified during severe downturns but have to be tailored to the expected duration of the shock and the institutions in place.** During the recent crisis, schemes such as short-time work programs were effective following temporary shocks, but not following permanent shocks, as the latter required instead policies to facilitate sectoral labor movements. They were also less effective in the presence of severe wage rigidities, or in dual labor markets.
- **Policies are also justified to avoid an increase in long-term unemployment and a drop in labor force participation during severe downturns.** Such policies can avoid skill erosion and bring back into the labor force previously discouraged groups. Indeed, they may have helped increase labor force participation by older groups during the recent crisis. Training programs and incentives to go back to school could also avoid the loss of human capital arising from increased youth unemployment.
- **Reforms to reduce employment protection gaps in dual labor markets could lead to smoother labor market adjustments, both by avoiding strict protection for regular contracts and abuse of temporary employees.** Before the crisis, some economies encouraged temporary employment contracts that were not subject to the strict protection that applied to regular contracts. Although this led to fast employment growth, temporary contracts became the weak link of labor markets during the recent crisis, leading to large overall employment losses and reducing the role of other shock absorbing mechanisms.
- **Wage setting mechanisms work best when allowing adjustment via centralized coordination for economy-wide shocks and firm-level bargains for specific ones.** Wage rigidities in the form of backward and asymmetric wage indexation and industry (intermediate) level wage bargaining became binding during the crisis, leading to worst employment outcomes.
- **Crisis-driven labor market policies should give their place to broader structural reforms in the medium term.** In addition to macroeconomic policies to support aggregate demand, there is still scope for labor market policies early in the recovery. However, maintaining them over the medium term could lead to distortions. Instead, structural reforms that will make labor markets work better and improve the business environment could support sustainable output and employment growth.

Annex 1. Heat Maps of Institutions: Labor Markets and other Structural Areas

International comparisons of structural characteristics have been criticized, as different indicators sometimes lead to conflicting assessments. To address this criticism, this annex aggregates a number of structural indicators from a variety of alternative sources to construct country-specific heat-maps of potential bottlenecks.²² By construction, flagged areas are those for which the structural indicators used as inputs agree. The methodology maps out institutional characteristics in a sample of 26 selected advanced economies (Mexico is assessed out of sample).²³ According to the results:

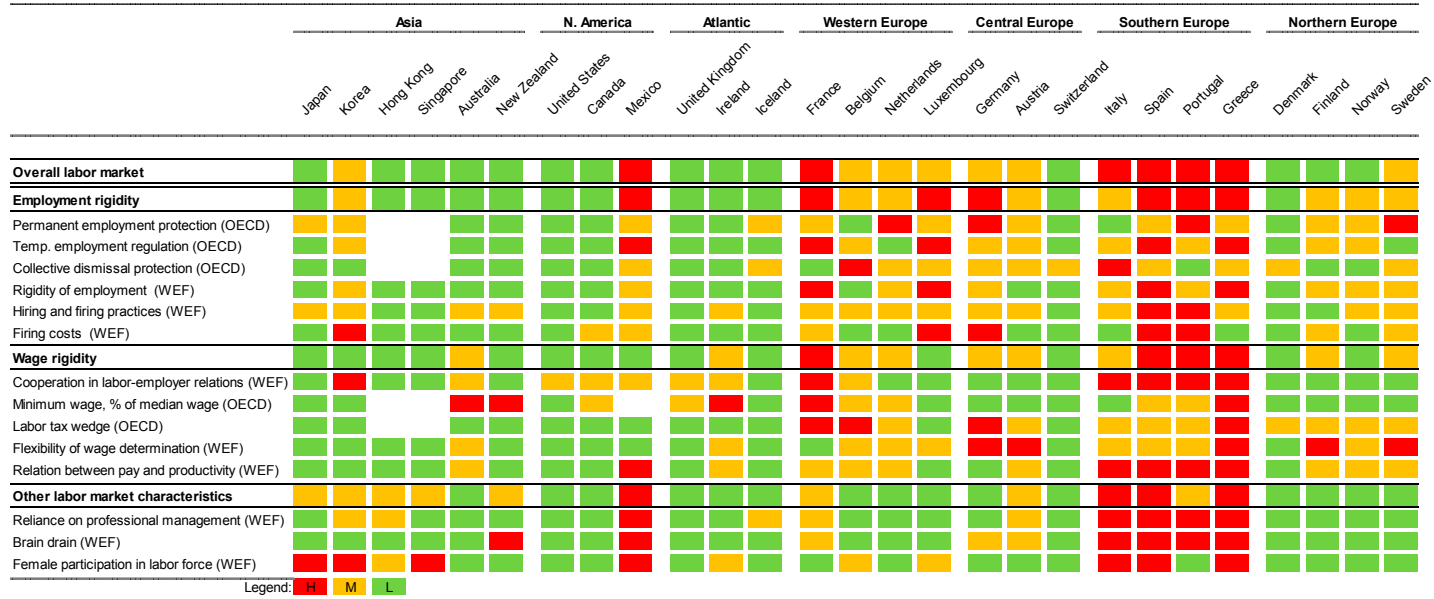
- Germany is flagged as high for employment rigidities, and medium for wage rigidities. Structural flags are also raised for human capital, business and services regulation and credit market rigidities.
- Korea is flagged as medium for employment rigidities and other labor market characteristics. It is also flagged as medium for rigidities in all other structural areas except human capital and innovation.
- Mexico is flagged as high for employment rigidities and other labor market characteristics. In addition, it is flagged as high for rigidities in most other structural areas (medium for openness to trade and credit rigidities).
- New Zealand is *not* flagged for employment and wage rigidities, but is flagged as medium for other labor market characteristics. It is flagged as high for bottlenecks in infrastructure, and medium in openness to trade and FDI.
- Spain is flagged as high for employment and wage rigidities as well as for other labor market characteristics.²⁴ It is also flagged as high for human capital and innovation bottlenecks and medium in other structural areas (such as business regulation).
- Sweden is flagged as medium for employment and wage rigidities, and for bottlenecks in institutions and contracts, and for credit market rigidities.

²²Indicators from: OECD Going for growth; the World Economic Forum Global Competitiveness Report (WEF); and the Economic Freedom of the World Report of the Fraser Institute (IEF).

²³The relative country rating for each indicator is low for a value below the sample average, medium (1 flag) for a value within 1 standard deviation above the sample average, and high (2 flags) for a value 1 standard deviation above the sample average. The flags are summed across indicators for each structural area and each country. The country rating in each area is based on thresholds using the above criteria. The overall ratings are determined by summing the flags across the structural areas using the same aggregation methodology.

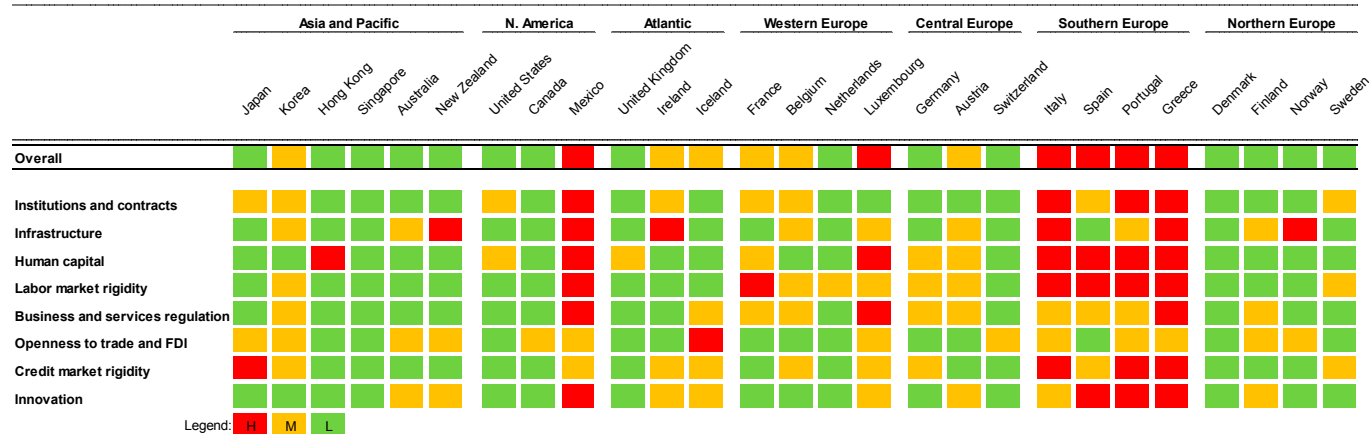
²⁴ These results do not reflect recent labor market reforms in Spain.

Heatmap of Labor Market Indicators



Sources: OECD, World Economic Forum and Fund staff calculations.
The table provides indicators of structural labor market inefficiencies. H, M and L for high, medium and low inefficiencies, respectively, in relative terms.

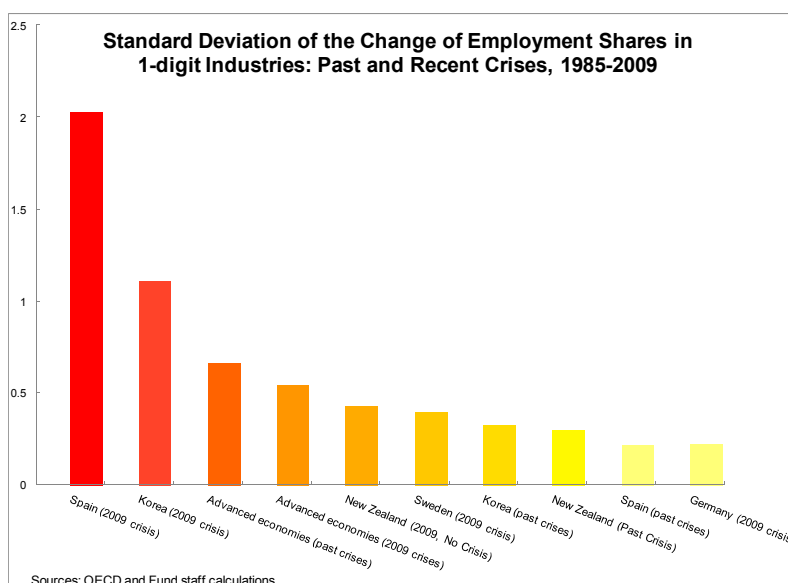
Heatmap of Structural Indicators



Sources: OECD, World Economic Forum, Fraser Institute and Fund staff calculations.
The table summarizes the main areas of structural inefficiencies, based on a number of indicators for each area. H, M and L for high, medium and low inefficiencies, respectively, in relative terms.

Annex 2. Shifts in Sectoral Allocation of Employment during Crises

Crises in advanced economies do not usually lead to large employment shifts across sectors. Using a standard definition of growth crises and data on the sectoral distribution of employment in advanced economies, the results suggest that growth crises are accompanied by only modest changes in the allocation of employment shares.²⁵ This is consistently the case in a sample of 32



crisis episodes in 21 advanced economies, during 1985–2009.²⁶

Despite the severity of the recent global crisis, the observed changes in the sectoral distribution of employment in advanced economies is similar on average to that observed during previous crises. Although it remains to be seen how new jobs will be distributed during the projected recovery, the experience so far (up to the end of 2009) has been consistent with past crises, with some exceptions:

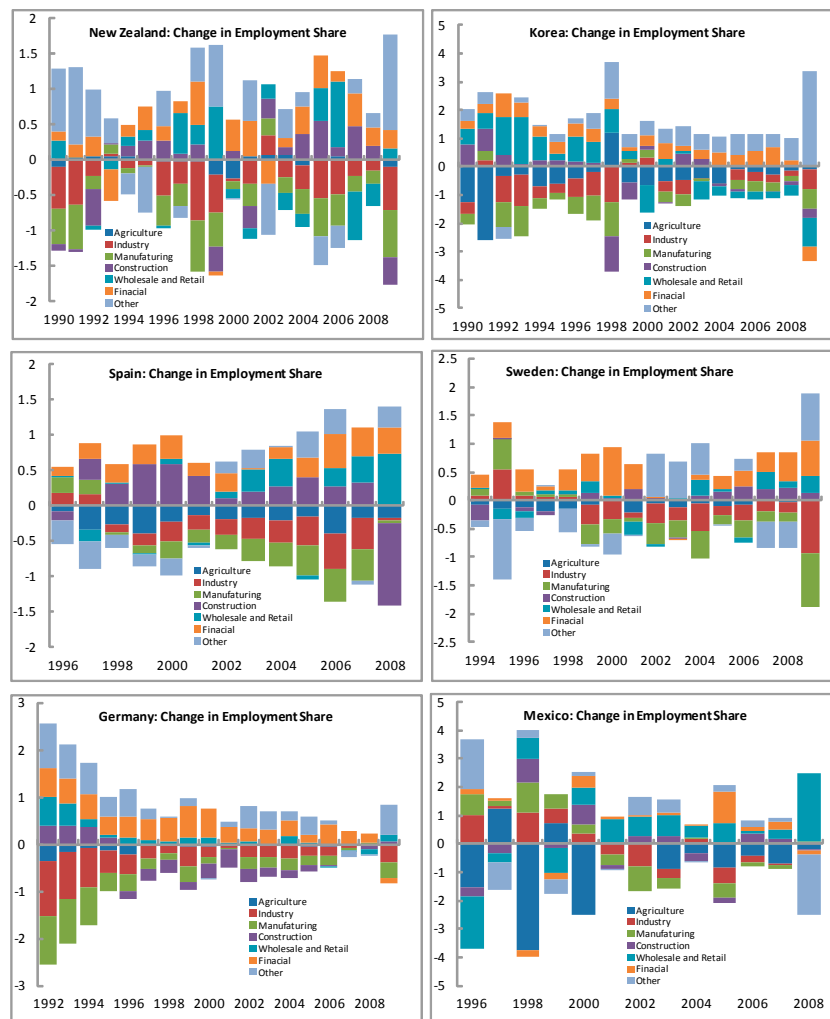
- Spain has already experienced considerably larger employment movements than other advanced economies during the recent crisis and compared with its own past crises.
- Germany is at the other extreme, with almost negligible employment movements.
- Korea has also experienced relatively large employment movements, even compared with its own past crises.
- Sectoral employment movements have been minor in New Zealand and Sweden.

²⁵The sectors include: agriculture, nonmanufacturing industry, manufacturing, construction, retail trade, finance and real estate, and other services. The definition of a growth crisis is the one used by the IMF Vulnerability Exercise for Advanced Economies, in which a growth crisis is identified if the difference between GDP growth in year t and the average in years $t-5$ through $t-1$ is in the bottom 5 percent of the sample as a whole.

²⁶Based on the standard deviation of the absolute change in employment shares in 1-digit industries one year after the crisis.

Assessing which sectors are driving these results during the recent crisis, the employment share fell in construction and industry (both manufacturing and nonmanufacturing), which was compensated in most cases by an increase in the employment share of services.²⁷

- In manufacturing and in nonmanufacturing industry, the employment shares fell in all countries but in Spain, where they remained almost flat.
- The employment share in construction fell in Spain, followed by New Zealand.
- The employment share in other services increased in all countries, while in finance it increased in New Zealand, Spain, and Sweden.
- Wholesale and retail services increased their employment share substantially in Mexico and Spain, but decreased it in Korea.



Source: OECD and IMF staff calculations.

²⁷As data for Mexico are only available up to 2008, the relevant chart is included only for information and is not being discussed in the text.

Annex 3. Output and Unemployment Dynamics during the Recent Crisis: A Panel Unobserved Components Analysis

Policies in most economies currently face the challenge of reducing unemployment from historically high levels during slow recoveries. As discussed in the main text, output and unemployment dynamics have varied considerably across economies during the course of the crisis. The imbalances in the output and labor markets depend on the nature of the shocks that caused them, the policy measures implemented to address them, and the institutions in the respective markets. Understanding the sources of these imbalances can help design effective policy measures to address them.

This annex analyzes the sources of output and unemployment dynamics in selected economies during the recent crisis. The analysis is based on a structural macroeconomic model of the world economy, disaggregated into its fifteen largest economies.²⁸ The discussion that follows focuses on the results for Germany, Korea, Mexico and Spain.²⁹ Estimates of output and unemployment gaps demonstrate the evolution of output and labor market imbalances. Historical decompositions help identify the structural determinants of output growth and the unemployment rate.

Measuring Output and Labor Market Imbalances

The output gap is a measure of cyclical output market imbalances, with positive values indicating excess demand pressure, and vice versa. In parallel, the unemployment gap is a measure of cyclical labor market imbalances, with positive values indicating excess supply pressure, and vice versa (see charts.)

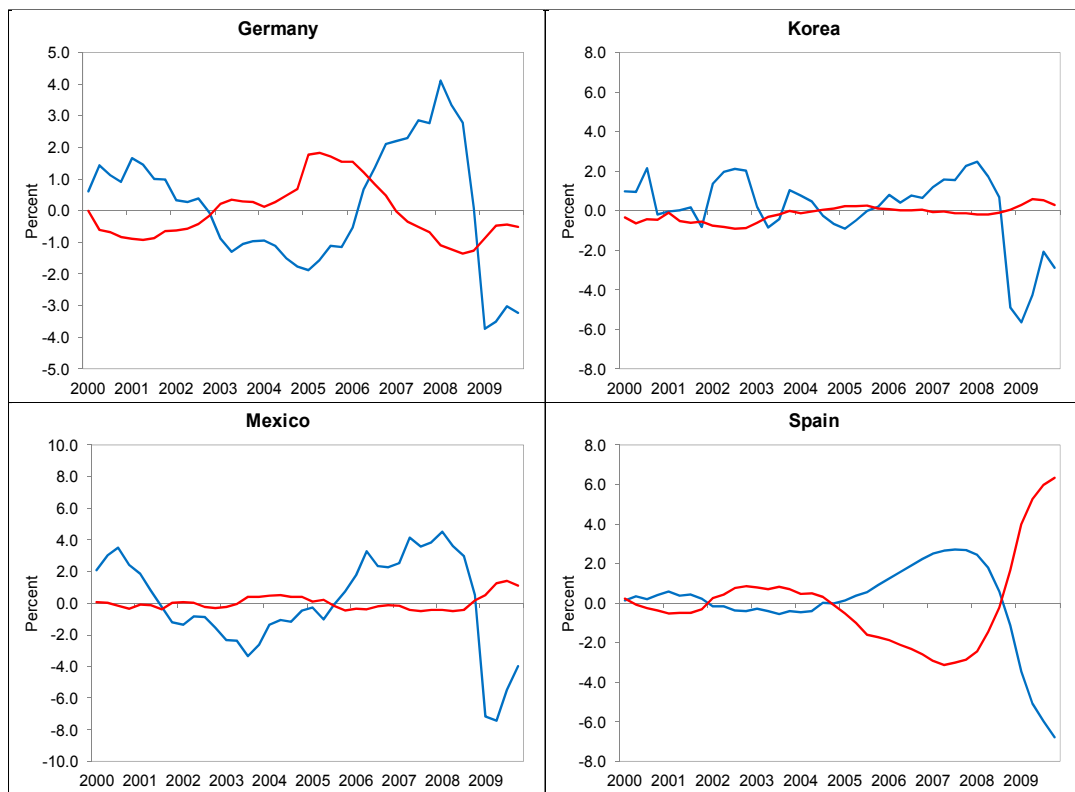
The output gap and the unemployment gap tend to be negatively correlated, an empirical regularity associated with Okun's law. During the current decade, this negative correlation has been particularly high in Spain, followed by Mexico, and then Korea and Germany. Moreover, during the last recession, identified as that period in which the output gap in each economy fell from peak to trough, these correlations increased in all countries, particularly in Korea and Mexico. These exceptionally high correlations during the crisis indicate that the simultaneous accumulation of excess supply pressure in the output and labor markets primarily reflected their responses to common shocks.

²⁸For a detailed description of this model, see Vitek, F. (2010), "Output and Unemployment Dynamics during the Great Recession: A Panel Unobserved Components Analysis," International Monetary Fund Working Paper No. 10/185.

²⁹The model does not include Sweden and New Zealand, as it focuses on economies that could possibly have regional or global systemic implications.

The model estimates suggest that output and labor market imbalances currently vary substantially across countries. Spain is estimated to have the largest output gap, followed by Mexico, Germany and Korea—they have been shrinking rapidly in Korea and Mexico. Spain is also estimated to have by far the largest unemployment gap. Mexico is also estimated to have a positive unemployment gap, but it is much smaller and has been falling. Korea's unemployment gap is converging towards zero, while Germany stands out as the only country with a negative unemployment gap. This high dispersion of the unemployment gap estimates, relative to the corresponding output gap estimates, motivates the analysis that follows on their structural determinants.

Output Gap versus Unemployment Gap Estimates



Note: Depicts smoothed estimates of the output gap ■ and the unemployment rate gap ■.

Identifying the Sources of Output and Unemployment Dynamics

The contributions of a variety of temporary shocks to the cyclical dynamics of output growth and the unemployment rate are measured with historical decompositions, distinguishing between those originating from domestic demand versus those originating from external demand, while controlling for the effects of permanent shocks on their trend paths.

The estimates suggest that positive domestic demand shocks that had contributed to the accumulation of excess output demand pressure during the precrisis period have been

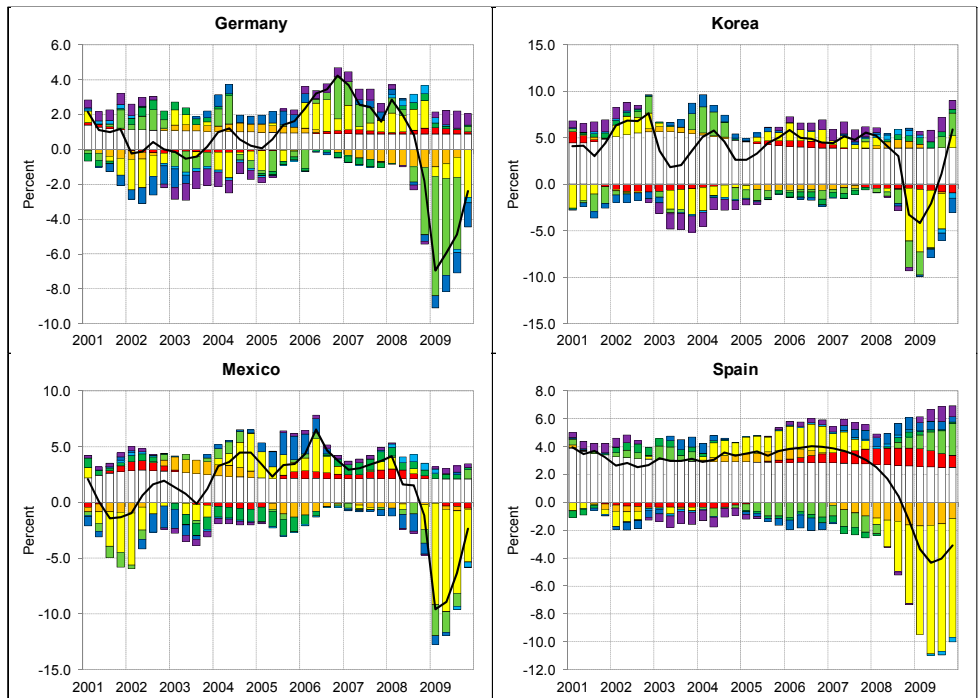
replaced by economy specific combinations of negative domestic and foreign demand shocks that have led to excess output supply pressure.³⁰ In Germany, small positive domestic demand shocks were dominated by large negative foreign demand shocks. In Korea and Mexico, large negative domestic demand shocks were amplified by negative foreign demand shocks. In Spain, large negative domestic demand shocks dominated small positive foreign demand shocks. The results also suggest that this rapid accumulation of excess output supply pressure was mitigated by exceptional monetary policy loosening in all countries.

The contributions of domestic and foreign output demand shocks to the unemployment rate have generally mirrored those to output growth.³¹ During the buildup to the recent crisis, positive domestic output demand shocks contributed to the accumulation of excess labor demand pressure in all economies, which was mitigated by negative labor demand shocks, except in Spain where positive labor demand shocks amplified it. During the crisis, economy specific combinations of negative domestic and foreign output demand shocks rapidly eliminated this excess labor demand pressure, generally supplanting it with excess labor supply pressure. Offsetting contributions from labor demand shocks indicate that this transmission of excess supply pressure from the output market to the labor market was strongly mitigated by countercyclical labor market policies or institutions. A notable exception is Spain, where domestic labor demand shocks have tended to amplify cyclical fluctuations, suggesting procyclical labor market institutions—for example, the prevalence of temporary employment contracts and wage rigidities.

³⁰Estimated historical decompositions of output growth attribute business cycle dynamics around relatively stable potential output growth rates primarily to economy specific combinations of domestic and foreign output demand shocks. For example, business cycle fluctuations in relatively open economies, such as Germany, have been primarily driven by foreign demand shocks, whereas fluctuations in relatively closed economies, such as Spain, have been primarily driven by domestic demand shocks.

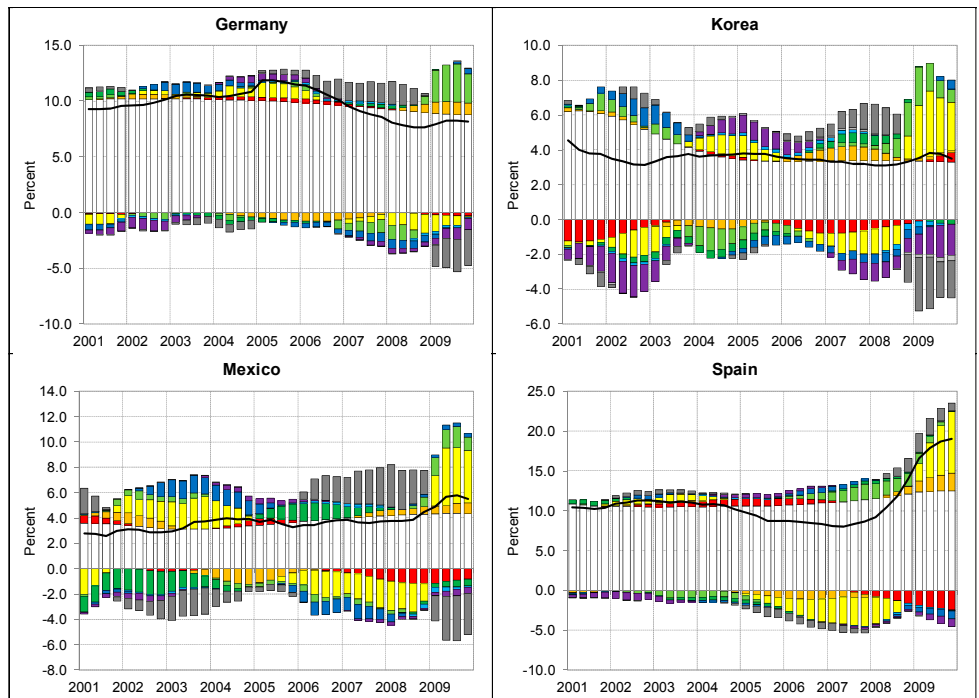
³¹Estimated historical decompositions of the unemployment rate attribute fluctuations at business cycle frequencies around less volatile natural rates of unemployment primarily to economy specific combinations of domestic and foreign output demand shocks, together with domestic labor demand shocks. Labor supply and demand shocks capture labor market dynamics that are not derived from output market dynamics, possibly reflecting labor market policies or institutions.

Historical Decompositions of Output Growth



Note: Decomposes observed output growth ■ as measured by the seasonal logarithmic difference of the level of output into the sum of a trend component □ and contributions from domestic output supply ■, foreign output supply ■, domestic output demand ■, foreign output demand ■, domestic monetary policy ■, foreign monetary policy ■, world risk premium ■, and world commodity price ■ shocks.

Historical Decompositions of the Unemployment Rate



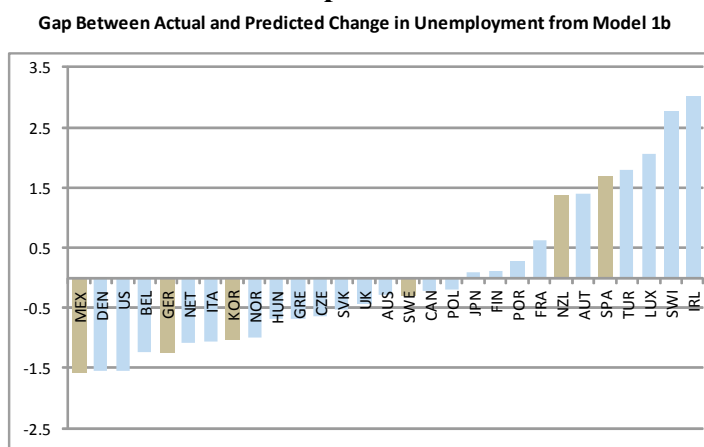
Note: Decomposes the observed unemployment rate ■ into the sum of a trend component □ and contributions from domestic output supply ■, foreign output supply ■, domestic output demand ■, foreign output demand ■, domestic labor supply ■, domestic labor demand ■, domestic monetary policy ■, foreign monetary policy ■, world risk premium ■, and world commodity price ■ shocks.

Annex 4. Explaining Unemployment Increases during the Crisis: The Role of Policies

This annex discusses results of an empirical model explaining the cross-country variation in the change in the unemployment rate among OECD members during the recent crisis based on policy responses, given the output shock and institutions.³² Most OECD countries increased resources allocated to existing active labor market policies (ALMP) to help the labor market adjust during the crisis. Some went further, by introducing new measures to sustain labor demand, or to improve labor market prospects for the unemployed. These policies were justified either by the need to avoid unnecessary labor market volatility in response to temporary shocks, or to promote movement of labor across sectors in response to permanent shocks. Although it is too early to assess the full impact of these policies, this annex provides a preliminary assessment of their impact on unemployment during the crisis.³³

Estimates from a regression that covers the OECD sample indicate what drove the changes in unemployment during the recent crisis.

The explanatory variables include labor and product market rigidities, the pre-crisis share of temporary employment, the change in the output gap, and a dummy variable based on the number of ALMPs that each country introduced in



³²The sample includes: Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States. The relatively narrow cross-section limits the extent to which country-specific features, including the nature of the shocks during the crisis, can be accounted for in this framework.

³³The analysis complements Chapter 3 of the IMF's Spring 2010 WEO by focusing on the role of crisis-driven labor market policies.

response to the crisis.³⁴ The main results include (see table):

- ALMPs in response to the crisis seem to have helped curtail unemployment increases. Controlling for everything else, shifting from an intermediate use of such policies to an intensive use reduced the unemployment rate by 1.8 percentage points.
- Product market regulations (PMR) seem to have resulted in lower unemployment, most likely by delaying structural adjustment. For similar reasons, employment protection and labor market rigidity seem to have also led to lower unemployment. However, the results suggest that for a given PMR index, the reduction in unemployment is subdued in countries with more rigid labor markets or strict employment protection. Likewise, for a given EPL or labor rigidity index, the higher the PMR, the lower the reduction in unemployment.
- A drop in the output gap is correlated with higher unemployment (Okun's Law).³⁵
- Countries with a high share of temporary employment and a rigid labor market or strict employment protection for regular employees experienced a higher increase in unemployment.
- For about half the countries in the sample, the prediction error of the change in unemployment is within 1 percentage point (see chart).³⁶

³⁴ Using OECD data and excluding income support for job losers and low-income earners, which are passive labor market policies; there are 10 possible areas of spending increase on ALMPs. The value of the ALMP dummy is determined as follows: 1 for increased spending in 2 to 4 areas; 2 for increased spending in 4 to 7 areas; and 3 for increased spending in more than 7 areas. The OECD reports that in Denmark and Switzerland, spending on ALMP increases automatically when unemployment increases. It is assumed that the automatic increase in spending pertains to 4 areas. Besides the automatic increased spending, Switzerland and Denmark are reported as having increased spending on ALMPs in one and 4 programs, respectively. In this regard, it is assumed that Denmark increased spending in 8 areas, while Switzerland did so in 5 areas. Future analysis could instead include actual amounts spent on these policies, when such data become available.

³⁵The output gap is defined as actual growth minus potential growth.

³⁶The predictions are based on Model 1b. It provides the best fit amongst the presented models as it has the lowest standard errors.

Determinants of Change in Unemployment

Explanatory variables	Model 1a	Model 1b	Model 2a	Model 2b
Intercept	15.05 *** 0.00	16.14 *** 0.00	16.68 *** 0.00	17.83 *** 0.00
Products market regulation index (PMR)	-10.58 *** 0.00	-7.55 *** 0.00	-12.54 *** 0.00	-8.55 *** 0.01
Employment protection legislation index (EPL)	---	---	-3.54 * 0.06	-4.95 *** 0.00
Rigidity of employment index (RIG)	-2.54 ** 0.03	-3.69 *** 0.00	---	---
Active labor market policies dummy (ALMP)	-2.14 *** 0.01	-1.77 *** 0.00	-1.66 ** 0.04	-1.53 *** 0.01
Change in the output gap	-0.41 *** 0.01	-0.35 *** 0.00	-0.19 0.26	-0.16 0.23
Share of temporary employment (SHTEMP)	0.14 * 0.09	-0.44 *** 0.00	0.10 0.16	-0.48 *** 0.01
PMR interacted with EPL	---	---	3.32 *** 0.01	2.19 ** 0.04
PMR interacted with RIG	2.01 *** 0.02	1.65 *** 0.01	---	---
SHTEMP interacted with EPL	---	---	---	0.25 *** 0.00
SHTEMP interacted with RIG	---	0.15 *** 0.00	---	---
Adjusted R-squared	0.41	0.70	0.44	0.67
S.E. of regression	2.13	1.51	2.10	1.62
F-statistic	4.19 ***	10.40 ***	4.54 ***	8.71 ***
Prob(F-statistic)	0.01	0.00	0.00	0.00
Number of observations:	28	28	28	28

Notes: The dependent variable is the change in unemployment rate between 2006 and 2009. The PMR and EPL indices are from the OECD (they both range from 1 to 6, from least to most restrictive regulation/legislation). The share of temporary employment is also from the OECD. The rigidity of employment index is from the World Bank's World Development Indicators database (from 1 to 10, from least to most rigid). ***, **, and * for statistical significance at the 1, 5, and 10 percent levels respectively. Standard errors are reported in the lines below the estimates.

Annex 5. The Determinants of Employment Changes: Evidence from Industry Data

The links between employment growth across one-digit industries and possible adjustment margins is analyzed using annual data during 1985–2009 for OECD economies. The results, which are only suggestive as the full impact of the crisis has yet to take place, include:

- A negative link between the real compensation rate and the change in employment—a 10 percent increase in real wages leads to a drop in employment by 1.5 percent.
- Changes in manufacturing employment are affected by changes in the real exchange rate—a 10 percent real exchange appreciation and rise in unit labor costs (ULC) lead to a decline in manufacturing employment by about 1 to 2 percent. Nonmanufacturing industry is affected by ULC changes, but not by changes in the real exchange rate.
- Public sector employment supports other services employment (especially in Korea).
- Employment protection seems to have a negative impact on employment. In contrast, active labor market policies seem to have a positive impact.
- Hours worked and the share of temporary employment do not seem to affect total employment in these specifications. This may be because of a different impact before and after the crisis. Indeed, when interaction terms with a dummy variable for 2009 are included, both variables become significant, with a positive sign for the share of temporary employment and a negative sign for hours worked—however, the former is driven by Spain.
- Since 2000, employment growth in Korea and Spain has been significantly better than in other OECD countries, even factoring in the recent recession. This could be driven by the fast growth of temporary employment contracts.

The estimated model provides some insights on what drove employment movements during the recent crisis. The main outliers are in construction, with Germany, Korea and Sweden experiencing a smaller drop in employment, and Spain a larger drop than the model predicted. Other outliers include nonmanufacturing industry for Korea, New Zealand, and Spain, where a larger drop was predicted by the model, and agriculture for New Zealand, where the actual drop was substantially larger.

Panel Regressions, One-digit Industries, OECD Economies, 1985–2009 1/

Independent variables	1985–2009	2000–09	2000–09 2/
Change in real compensation (t-1)	-0.17 ***	-0.16 **	-0.15 **
Change in the real exchange rate (t-1)	0.1	-0.02	0.01
Change in the real exchange rate interacted with manufacturing (t-1)	-0.16 ***	-0.18 **	-0.19 **
Change in hours worked per person (t-1)	-0.07	0.2	0.1
Change in manufacturing ULC (t-1)	-0.12	-0.09	-0.07
Change in ULC in other sectors (t-1)	-0.24 ***	-0.15 **	-0.02
Change in public sector employment interacted with other services	0.12	0.16	0.22
Change in public sector employment interacted with other services in Korea	0.75 ***	0.75 ***	0.75 ***
Employment (t-2)	-0.01 ***	-0.01 ***	-0.004 ***
Real compensation (t-2)	-0.01	-0.02	-0.02
Real exchange rate interacted with manufacturing (t-2)	-0.02	0.03	-0.01
Employment protection (t-1)			-0.006 *
Share of temporary employment (t-1)	-0.02	0.1	0.01
Active labor market program index (t-1)	0.02 ***	0.01	0.001
Spain dummy variable			0.03 ***
Korea dummy variable			0.016 ***
R squared	0.39	0.34	0.32
Number of observations	1934	1160	1141

1/ All regressions include country and industry dummy variables unless stated otherwise. ***, **, and * for statistical significance at the 1, 5, and 10 percent levels respectively.

2/ Only country dummy variables for the 6 countries in this study.

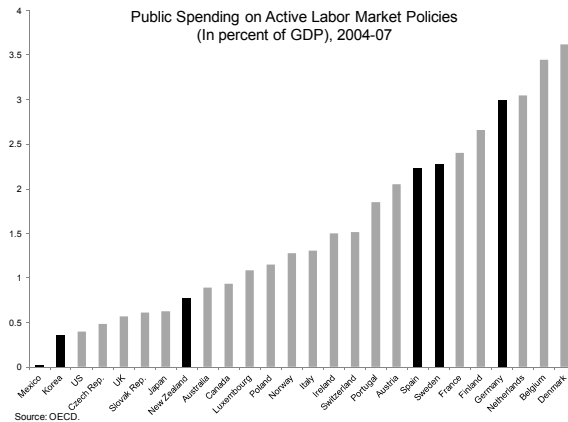
Employment Growth Across Industry in 2009
(In percent per annum)

	Agriculture	Non-manufacturing Industry	Manufacturing Industry	Construction	Trade	Finance and Real Estate	Other Services
Germany							
actual	0.58	-1.96	-2.77	0.34	0.29	-1.17	1.97
fitted value	-3.2	-0.6	-7.6	-8.3	-3.2	-2.8	1.1
residual	3.78	-1.36	4.83	8.64	3.49	1.63	0.87
Korea							
actual	-2.65	5.69	-6.17	-3.37	-5.22	-5.75	14.55
fitted value	-3.6	0	-4.9	-8.4	-3.2	-2.7	10.7
residual	0.95	5.69	-1.27	5.03	-2.02	-3.05	3.85
Mexico							
actual	3.07	-2.77	-9.68	-10.12	-1.08	-1.5	2.76
fitted value	-0.8	-1	-7.6	-9.8	-2.8	-2.4	0.9
residual	3.87	-1.77	-2.08	-0.32	1.72	0.9	1.86
New Zealand							
actual	-21.19	6.66	-7.59	-7.68	-1.31	-0.06	3.43
fitted value	-1.5	0.8	-5.5	-7.2	-2.1	-1.6	2.6
residual	-19.69	5.86	-2.09	-0.48	0.79	1.54	0.83
Spain							
actual	-3.4	7.83	-15.88	-26.37	-6.15	-4.23	1.57
fitted value	-1.46	2.1	-12.4	-6.6	-1.2	-0.1	3.8
residual	-1.94	5.73	-3.48	-19.77	-4.95	-4.13	-2.23
Sweden							
actual	-1.73	0.72	-10.56	-1.15	-1.51	1.45	-0.64
fitted value	-2.2	0.4	-7	-7.4	-2.2	-1.9	1.5
residual	0.47	0.32	-3.56	6.25	0.69	3.35	-2.14

Annex 6. Spending on Active Labor Market Policies and Job Creation

Active labor market policies (ALMP) have been credited with supporting employment during the recent crisis. Empirical evidence using a Data Envelopment Analysis (DEA) for the precrisis period suggests that when it comes to ALMPs, what matters is not quantity, but quality.³⁷ The results also suggest that ALMPs lead to new jobs only in economies without strict employment protection legislation for regular employees (EPL).

The use of ALMPs varies substantially across OECD economies. It has been relatively high in most European economies (including in Germany, Sweden and Spain). However, it has been substantially lower outside Europe and in emerging economies (including in New Zealand, Korea and Mexico).



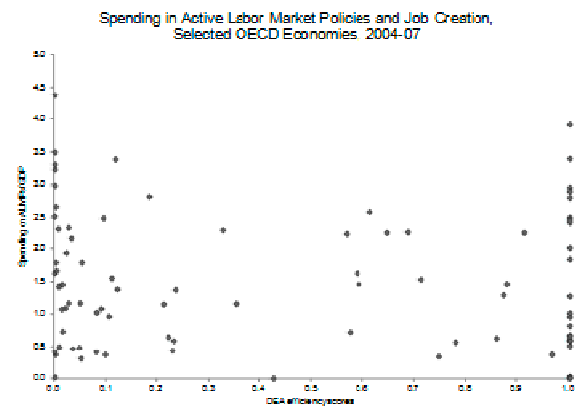
Estimates of DEA efficiency scores focusing on the precrisis period (2004–07) help determine the extent to which ALMPs lead to new jobs. The analysis treats spending on ALMPs and the change in the working age population as inputs and the changes in the total labor force and the number of employees as outputs. Therefore, the analysis provides estimates for the efficiency of ALMPs in terms of both keeping potential employees in the labor force and eventually helping them find jobs, while taking into consideration demographic trends.



³⁷Data Envelopment Analysis (DEA) is primarily used in the finance literature to determine bank efficiency based on different input-output combinations. It is a non-parametric approach that estimates efficiency frontiers by solving a series of linear programming problems. The efficiency of each DMU is then measured by computing its distance from the frontiers. Efficiency ranges from 0 to 1, with a unit operating on the frontier (efficiency of 1) measured as fully efficient. For more details, see Cooper, W. W., Seiford, L. M., and Tone, K., 2006, *Introduction to Data Envelopment Analysis and its Uses*, Springer Science and Business Media.

The results indicate no link between spending on ALMPs and DEA efficiency scores. The estimates suggest high efficiency in New Zealand, Mexico, Germany, and Spain, and low efficiency in Sweden and Korea. However, there is no correlation between spending on ALMPs as a share of GDP and estimated efficiency scores.

Evidence from a simple panel regression with fixed country effects suggests that ALMPs are inefficient in countries with high EPL. When ALMPs and an EPL index for regular employment (as measured by the OECD) enter independently in a regression that has the estimated DEA efficiency score as the dependent variable, only the latter has a statistically significant coefficient estimate. This estimate is negative, suggesting lower DEA efficiency scores in countries with high EPL. When the regression includes in addition an interaction term of ALMPs with EPL, then only this interaction term is statistically significant. Its negative estimate suggests that high spending in ALMPs is wasteful spending, in terms of DEA scores, in countries with high EPL. The insignificant estimates of ALMPs and EPL suggest that ALMPs lead to new jobs only in economies with low EPL. These results hold even after controlling for per capita GDP and for real GDP growth.



Panel Regression with Fixed Country Effects, 2004-07
 Dependent Variable: DEA Efficiency Scores
 Cross-sections included: 25 OECD economies
 Total observations: 99

Independent variables

In (real GDP per capita)	0.03 (0.05)	0.04 (0.05)
Real GDP growth	0.08*** (0.02)	0.08*** (0.02)
ALMP/GDP	-0.11 (0.19)	0.49 (0.44)
EPL	-0.80*** (0.25)	-0.29 (0.31)
(ALMP/GDP) x EPL		-0.26** (0.12)
R-squared	0.42	0.43

Note: White cross-section standard errors in parentheses.
 "****" and "***" for statistical significance at 1 and 5 percent levels, respectively.

Annex 7. Can Policies Reduce the Human Costs of Long-Term Unemployment?³⁸

Recessions leave scars on the labor market; the Great Recession of 2007–09 has left gaping wounds. Among OECD economies, unemployment rates increased almost everywhere over the course of the recession, notably in Spain, Ireland and the United States.

This annex makes two points. First, evidence from past recessions suggests that the costs of the recent increase in unemployment—and particularly long-term unemployment—could be very high. Second, the rising tide of recovery does not provide much of a lift to the boats of the long-term unemployed; more targeted policies such as short-time work and hiring subsidies may be needed to help them.

Costs of long-term unemployment

The human costs of unemployment are much more far-reaching than the immediate temporary loss of income.³⁹ A decline in earnings is more pronounced for those who lose their jobs during a recession. Studies for the U.S. show that these earnings losses persist in the long run: 15–20 years after a job loss in a recession, the earnings loss amounts on average to 20 percent. The hardship of job loss has serious negative impacts on health. In the short run, layoffs are associated with higher risk of heart attacks and other stress-related illnesses. The increased mortality rate due to unemployment leads to an average loss of life expectancy from 1 to 1.5 years.

Children of laid-off parents also suffer: in the short-run, parental job loss tends to reduce the schooling achievement of their children: parental job loss increases the probability that a child repeats a grade in school by nearly 15 percent. In the long-run, a father's income loss also reduces the earnings prospects of his sons: evidence from Canada suggests that children whose fathers were displaced have annual earnings about 9 percent lower than similar children whose fathers did not experience an employment shock. A study using detailed individual data from Sweden finds that lower parental income significantly increases children's mortality later in life, even after controlling for children's lifetime income and educational attainment.

These costs increase with the duration of unemployment spells. The longer the time spent out of work, the larger the loss of human capital and the larger the risk of becoming discouraged from participating in the labor force. Long-term unemployment also reduces the average probability of being rehired: in the U.S., for example, the probability of being rehired in the

³⁸Prepared by Mai Dao and Prakash Loungani (Research Department).

³⁹For a survey of the evidence, see Dao and Loungani (2010), “The Human Cost of Recessions and Crises: Assessing It, Reducing It,” Background Paper for the IMF/ILO conference in Oslo, September 13, 2010.

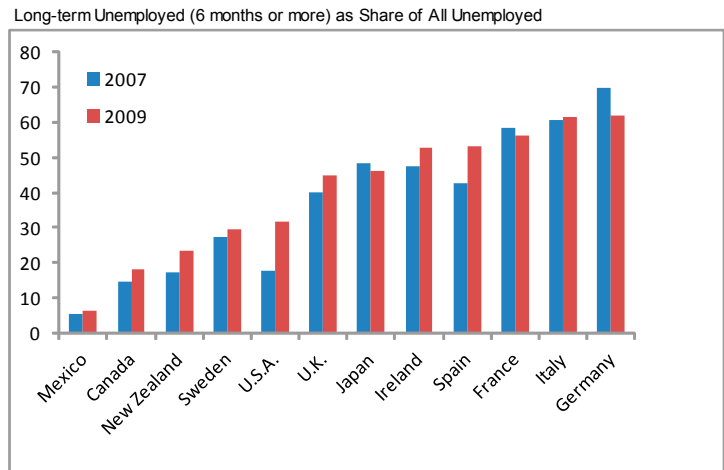
next month for a person who was unemployed for 26 weeks or more is less than 10 percent, compared to over 30 percent for someone who was unemployed for less than 4 weeks. A longer unemployment spell thus carries the risk of entrenching cyclical unemployment into a structural phenomenon and hysteresis.

The share of long-term unemployment has already started increasing in some OECD economies. Though in some countries—Germany, France, Italy and Japan—the share has not changed or has even decreased, the share was very high before the crisis. This indicates the presence of structural factors hindering the re-employment prospects in these countries that need to be addressed.

Can policies reduce long-term unemployment?

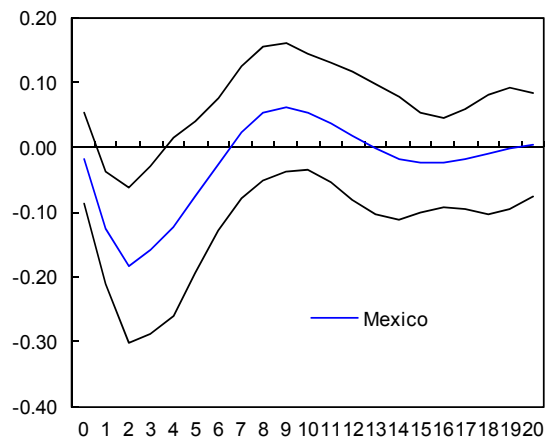
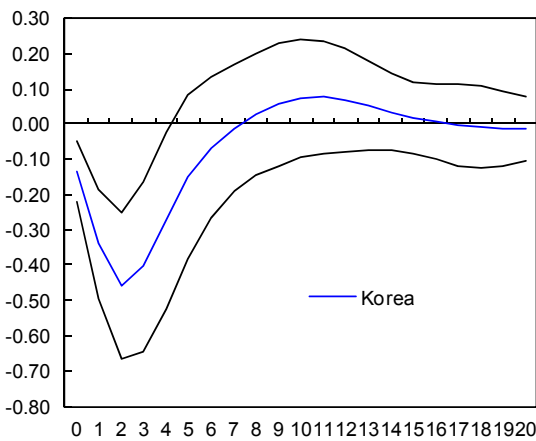
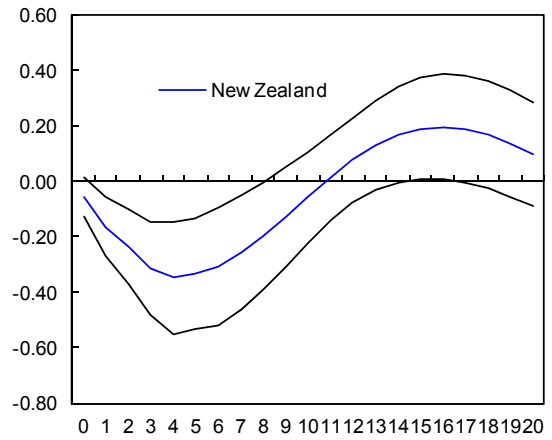
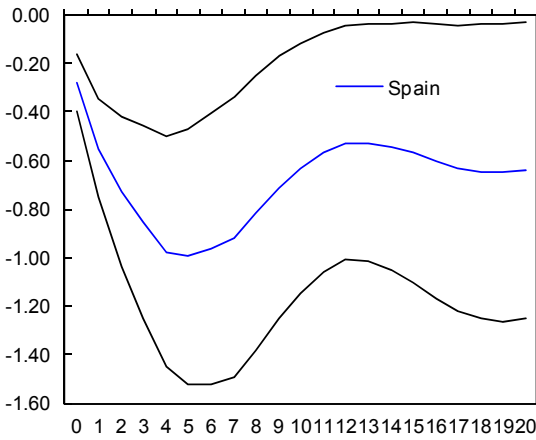
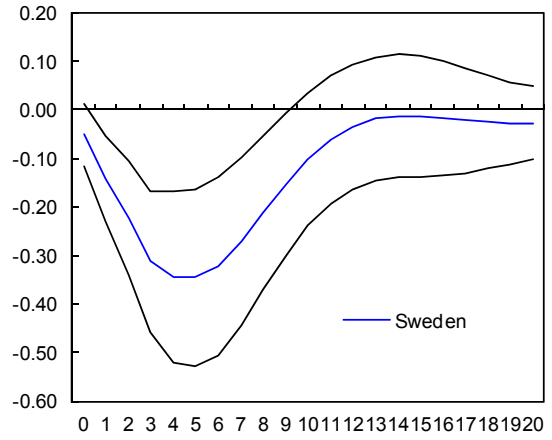
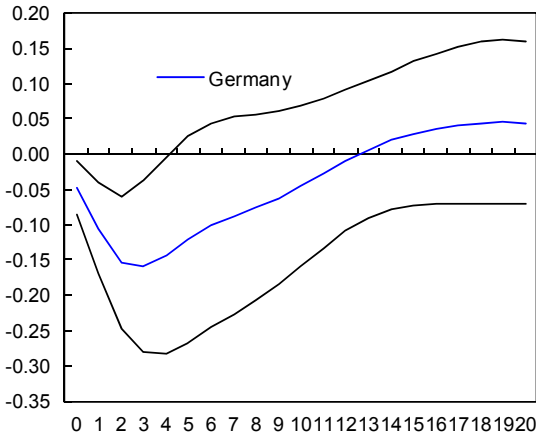
Okun's Law relates an increase in cyclical unemployment to a fall in output or aggregate demand. As shown in the main text, evidence at both the aggregate level and the industry level suggests that, though other factors are also at play, Okun's Law continues to hold. Indeed, VAR estimates illustrate the response of unemployment to real GDP in the

countries in the sample. In each case, unemployment falls in response to a boost to real GDP. Hence, supporting the recovery in aggregate demand could help reduce unemployment.



However, there are two problems with this general strategy. First, at the present conjuncture, the potential for monetary and fiscal policies to stimulate aggregate demand in 2010–11 is limited. Policy interest rates are already very low or at the zero bound in many countries. And in countries where there are concerns about fiscal sustainability, the space for fiscal policy to act could also be limited. Second, even if there was more policy space, the evidence suggests that the impact of aggregate demand on long-term unemployment is much more limited than the impact on unemployment as a whole.

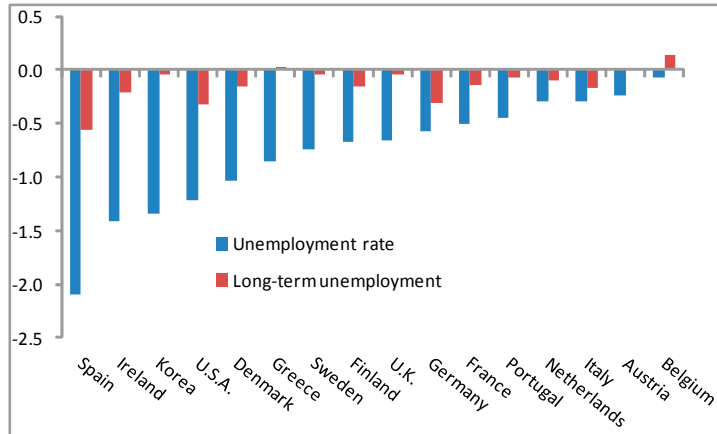
Decline in Unemployment Rate in Response to an Increase in Real GDP



Empirical evidence for OECD economies suggests a weak response of long-term unemployment to an increase in real GDP; indeed, considerably less so than for aggregate unemployment. Therefore, more targeted policies may be needed to help the long-term unemployed.

As also discussed in the main text, short-time work programs could be an option. To support labor demand and save existing jobs in the face of declining aggregate activity during the crisis, governments in various countries resorted to policies that allow firms to retain workers but reduce their working hours and wages. These short-time

Decline in Unemployment and Long-term Unemployment over a Year in Response to An Increase in Real GDP



work programs were extensively used in Germany, Italy and Japan, and are often credited for having played a crucial role in dampening the increase in unemployment in these countries. Governments typically subsidize firms for parts of the wage bill, sometimes combined with subsidies for on-the-job training for employees (e.g., Sweden). When implemented successfully, short-time work programs can spread the burden of the downturn more evenly across workers and employers; this contributes to supporting aggregate demand by preventing wage deflation, and reduces future hiring costs as well as loss of workers' human capital until the labor market recovers. The usage of short-time work programs as well as their contribution to the dampening of unemployment has varied considerably across countries, implying that the design of the program is vital for its success.

Subsidies to short-time work are costly not only because of the strain on public finances. Its implementation is difficult as it creates an incentive for firms to free-ride the subsidy even when conditions improve. More importantly, if the downturn affects certain firms and industries in a permanent way, the program can also obstruct a necessary reallocation of resources to other industries, hence slowing down the recovery through structural adjustment. However, these potential efficiency costs are likely to be more relevant in recovery periods, when it is important to start phasing out the measures. During a severe recession, when employers cut hiring in the face of heightened uncertainty, deadweight loss and diminished reallocation are bound to be of second order importance.

A systematic empirical study of the merits of short-time work during the crisis is still to be done. In general, a careful evaluation of the short-time work program requires looking beyond the rate of enrollment in the short-time scheme in a country. For the case of

Germany, a recent investigation by Möller (2010) challenges the view that the benign labor market experience can be mostly explained by the short-time work program.⁴⁰ Instead, the country-specific implication of the crisis (hitting mostly export-oriented manufacturing firms) as well as the initial conditions prior to the crisis (shortage of trained workers) led to strong incentives for labor hoarding on the side of German firms. However, although not likely to be the driving force, the scheme does appear to have supported this employment friendly incentive in a beneficial way.

It is important to stress that short-time work is intended to help prevent excessive destruction of jobs that are viable in the long term. Whether this has in fact always been achieved is questionable. For example, unlike in Germany, where short-time work usage has been concentrated in sectors that have experienced an adverse but temporary demand shock (mainly export-oriented manufacturing), short-time work usage in Italy has been persistently higher in some sectors (mechanical and textiles, leather) for several years prior to the crisis.⁴¹ This persistent use of short-time work in some sectors in Italy suggests that the program has served to delay structural layoffs in declining industries instead of smoothing the impact of temporary demand shocks on viable jobs.

Another tool aimed at directly stimulating labor demand is hiring subsidies. These were also used widely in many advanced economies in response to the crisis. In particular, the subsidies (given as direct job, wage subsidy or reduction in payroll taxes) were targeted at specific groups of the labor force that are most vulnerable to joblessness: the long-term unemployed and/or youth (e.g., in Austria, Finland, Portugal, Sweden, Switzerland). Some countries also target job creation in certain hard-hit regions (Korea, Mexico) or specific sectors (e.g., services in Japan).

As is the case with short-time work, it could be argued that in deep recessions the potential inefficiencies arising from hiring subsidies are less severe than the costs of rising or persistent unemployment. The specific targeting strategies that most countries have followed also serve to reduce potential misallocation of subsidies, as they should spur hiring for groups that are most adversely affected and least likely to be rehired in the absence of the subsidies.

⁴⁰Möller, J., 2010, "The German Labor Market Response in the World Recession—Demystifying a Miracle." *Zeitschrift für ArbeitsmarktForschung*, Vol. 42 (4), pp. 325–36, Springer: Berlin/Heidelberg.

⁴¹See IMF, WEO, April 2010, Chapter 3.