Financial Crises and Female Work

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Abstract

The worst social consequences of the 2007-08 financial crisis and subsequent (2008-09) global recession are being felt this year (2010), because of the usual delays in the labour market effects. The impact is deeper on the weakest segments of the labour market: young people, old workers and vulnerable employment in general. In this paper, we focus on the extent of the impact of financial crises on female labour force, which has been particularly hurt by the crisis. The impact is more significant on labour force participation rates than on unemployment rates, since after crisis women move to informal activities or retire from the labour market.

After a review of the existing literature and a discussion of very recent data on labour market dynamics, with a special focus on the gender effects, we present new econometric results on the impact of past financial crises on female labour force participation and female unemployment. We empirically investigate this relationship by employing the random effects panel estimation method on a large panel of countries (64) for the period 1980-2005. To investigate the severity of financial crises for economies at different levels of economic development, we re-estimate our model for sub-samples of different income groups. For further robustness checks and sensitivity analysis, alternative definitions of crises have been used in empirical estimations. Finally the "persistence" of the impact of financial crises is also investigated.

Although we are aware of the peculiarities of the current crisis – especially its global nature (compared to previous financial crises that in most cases related to individual countries or specific group of countries) and its differentiated impact across economic sectors and countries – we think that some interesting inferences can be obtained also for the likely developments of the current crisis and the necessary policy actions.

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1. Introduction and aim of the paper

The main features of the last financial and economic crisis are well known (and partially reviewed in Section 2). As a matter of fact, the world suffered from the biggest recession since the Great Depression of the '30s. The crisis has persisted in 2009, with widespread consequences on economic performance, labor productivity and employment in all countries around the world. Notice that the real effects of financial crisis (on production, income, expenditure, etc.) are always lagged[1].

Considering the labour market consequences of the crisis, the problem is that – despite a recovery that is going on (although weak and uncertain)[2] since the Summer of 2009 – all negative effects have not yet fully displayed, because of even longer lags. Moreover, gender specific impact of financial crises cannot be ignored. It is obvious that the impact has been deeper on the weakest segments of the labour market: young people, old workers, vulnerable employment in general and (at least in many world regions) women.

But can we learn something from past financial crises? The key contribution of this study is the assessment of the impact of past (1980-2005) financial crises on female labour force participation and female unemployment. Of course, we are aware of the peculiarities of the last crisis – especially its global nature[3] – compared to previous financial crises, concerning in most cases individual countries or specific group of countries. Nevertheless, we think that – with appropriate cautions in the interpretation of the results – some inferences can also be made with respect to the effects of the last crisis[4] and the more appropriate policies to be adopted.

Some extensions of the empirical study provide interesting responses to additional aims. The analysis by different income groups helps to understand the different impact on female work for economies at different levels of economic development. The examination of persistence of the impact of the crisis allows to estimate when the impact of the crisis will probably end.

The structure of the paper is the following. In Section 2 there is a brief review of the literature on female work and gender gap, then a description of financial crises and their labour market impact, and finally a discussion of the effects of the recent global crisis (based on the most recent available data), especially on women. Section 3 presents our econometric investigations on the impact of past financial crises on female labour force participation and female unemployment. Some policy implications - useful also for a better implementation of policy responses to the crisis and support of women at work - are discussed in Section 4.

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[1] It should be noted a remarkable shift (at the beginning of 2010) - more pronounced in some countries than others - from a financial crisis in the private sector to a fiscal (sovereign debt) crisis, because of large increases in public deficits, mainly as a consequences of GDP and revenue declines/ accompanied by an increase in public expenditures.

[2] This is particularly true for developed economies (e.g. in the EU the fall in GDP was about -4% in 2009, and even higher, up to about -5%, in countries like Germany and Italy); on the contrary, in emerging countries economic growth has returned soon to pre-crisis high rates (about 8-10% in China and India).

[3] As for the link between subprime mortgage defaults and global financial crisis, see for example Brunnermejer (2009).

[4] There are some other examples, e.g. Verick (2009), that in order to investigate the impact of the recent crisis on the labour market (especially on young men and women) begins by considering the effects on unemployment of the past "Big 5 Crises" (Spain 1977, Norway 1987, Finland 1991, Sweden 1991, and Japan 1992).

2. Literature review on female work, financial crises and the labour market impact of the recent global crisis

2.1. Female work, women segregation and gender gap

Increased access to labour markets for women has great potential as a contribution to economic development, but only if the work in which women are engaged is decent and productive. On the contrary, women are often in a disadvantaged position in comparison to men in labour markets around the world.[5]

First of all, in most countries of the world female participation rates are much lower than the male ones, because of a prevailing accepted norm, according to which men are the principal breadwinner and women are the primary caretaker of the family and caregiver. Of course, this dichotomic "division of labour" evolves over time in function of progresses in education, income, cultural background, etc.; but it is still dominant, not only in developing countries but also in certain areas of developed world (e.g. in countries of Southern Europe).

Also when women work outside the family[6], they operate as unpaid family workers in household enterprises, "autonomous" (own-account) workers, micro-business operators, subcontracted home-workers and domestic services workers. In fact, in many countries women are concentrated in non-regular employment, in unskilled and semi-skilled jobs, and in low pay levels.

Even when women are officially recorded in employment statistics, there is often a gender-based job segregation: female workers are typically employed in labour-intensive, export-oriented manufacturing (from clothing, footwear and processed foods to micro-circuits and electronic products), in many public services (education, health services, family support) and also in other service activities (trade, distribution, restaurants, tourism,etc.).

Within manufacturing, in contemporary global production chains, a small core of regular, permanent workers ensure quality and stability, while a flexible and mobile workforce – casual workers, temporary jobs, contract workers and home-workers – serve as a buffer to accommodate fluctuations in demand or just-in-time ordering. Thus the weakest segments of the labour market – women but also young workers – are often regarded as a "flexible reserve", to exploit in upturns and expel in downturns.

Nevertheless, it may happen in some instances that women's employment is counter-cyclical: firms may attempt to reduce costs, by employing cheap forms of labour, such as non-regular or atypical workers, workers (young people or women) with low wages, etc. In general, it is however likely that a crisis, instead of leading to open unemployment causes a rise in under-employment and informal activities, both in urban and rural areas.[7] This particularly refers to women, who are over-represented among the

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[5] The two sentences are taken from ILO (2009), that also recalls the main legal instruments internationally adopted to contrast gender discrimination: from ILO's "gender equality" conventions and the "decent work agenda", to the United Nations' Millennium Development Goals, to EU laws and regulations.

[6] See also Dejardin and Owens (2009). Unpaid care work further combines, for many women, with the time spent at work and constrains women's options for paid work (i.e. how much time to engage in paid work outside the home).

[7] It should be noted that female workers are likely to find alternative jobs more quickly, because they are also more willing to accept lower paid jobs and informal work. This behaviour is similar, in some developed countries, to that of the immigrant workers.

hidden unemployed or the underemployed, which also means working fewer hours than optimal.

In most of world countries the gender gap is accompanied by a wage gap. Average wages of women are normally lower than the males equivalent, taking into account economic sector, type of job, human capital required, etc.

Finally, the decision of many governments to cut – after the crisis – public expenditure causes in many cases heavy burdens on women: just think of the cuts on education, health services, care works, etc.

We can conclude by noticing that the empirical evidence on past financial crises (and generally on economic downturns) suggests that *young* (e.g. World Bank, 2007), *old* (e.g. OECD, 1998), *unskilled*, *female* workers as well as *migrants* are particularly vulnerable and are more likely to bear the brunt of rising unemployment, leaving the labour market – or at least the formal and most secure occupations: vulnerable employment is bound to increase. [8]

2.2 The labour market impact of financial crises

First of all, we report in this sub-section an important definition of "financial crisis", that has been considered in the literature and we shall use in our empirical investigations. It should be emphasized that national financial crises (without significant external effects) are obviously very different, in a *worldwide* perspective, from international financial crises. For example, according to Bordo (2006) and Reinhart and Rogoff (2008a, 2008b, 2009), there were eight episodes of major international financial crisis since 1870[9].

However, in order to econometrically estimate the *national* labour market impact – especially on females – of past financial crises, in this study we use the definition of "financial crisis" adopted in Honohan and Laeven (2005), that consider at country level both "*systemic banking crises*" (when a country's corporate and financial sector experiences a large number of defaults and financial institutions and corporations face great difficulties repaying contracts on time)[10] and "*non-systemic banking crises*" (e.g. crises limited to a small number of banks).

In addition, it would be also useful to consider (in a sensitivity analysis): (i) "systemic banking crises" alone (as above defined); (ii) "currency crises" defined as a

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[8] Vulnerable employment is often characterized by inadequate earnings, low productivity and lack of normal conditions for a "decent work". ILO (2010) - that defines vulnerable employment as the sum of own-account workers and contributing family workers, people with informal work arrangements, often lacking adequate social security and recourse to effective social dialogue mechanisms – maintains that this type of employment has increased after the recent crisis.

[9] We briefly recall the dates and countries of origin of the eight "international financial crises": (i) in 1873 German and Austrian stock markets collapsed with effects on the rest of Europe and Americas; (ii) in 1890 a debt crisis involved Latin America (especially Argentina); (iii) in 1907 a fall in copper prices caused financial panic in the US with effects on Europe, Latin America and Asia; (iv) in 1929 with a stock market crash in US started the well known "Great Depression"; (v) in 1981-82 a Latin American debt crisis began producing a decade-long debt crisis across developing economies; (vi) in 1991-92 real estate and equity price bubbles burst in Scandinavia and Japan, while in Europe the ERM entered into crisis; (vii) in 1997-98 the Asian and Russian crises; (viii) finally, in 2007-08 the worst financial crisis (after 1929) started in US. For more details, see IMF (2009, p. 128).

[10] As a result, non-performing loans increase sharply and all or most of the aggregate banking system capital is exhausted.

nominal depreciation of the currency of at least 30 percent that is also at least 10 percent increase in the rate of depreciation compared to the previous year (Laeven and Valencia, 2008); (iii) "sovereign debt crises" defined as when a sovereign default to private lending or debt is rescheduled (Laeven and Valencia, 2008).

Now we partly review the main literature on the labour market impact of financial crises. A first obvious result emerging from the empirical literature on past financial crises is that unemployment substantially increases (World Bank, 2008).

The size of the impact can differ across countries, because of differences in institutional conditions or in the working of labour and output markets. Some national level studies (see, for example, the cases of Indonesia and Mexico) showed that a smaller increase in unemployment can be favoured by a reduction in working hours (Beegle et al. 1999) and a decline in wages. Especially in developing countries, sectoral and regional reallocation of labour are usually important (e.g. workers move back to agriculture, i.e. from urban to rural area)[11], including movements into informal sector and toward subsistence activities. Some researches (e.g. Fallon and Lucas, 2002), regarding the financial crises in East Asia and Mexico during the 1990s, found that aggregate employment fell by much less than production declines and even increased in some cases; however, these aggregates mask considerable churning in employment across sectors, employment status, and location.

In addition, a large theoretical literature suggests that unemployment rates tend to rise significantly and remain higher for some years after a (financial) shock. In short, the increase in the unemployment rate induced by the crisis tends to persist over time. Long spells without employment negatively affect individual "human capital" making more difficult for the long-term unemployed to find jobs. So, the *hysteresis effects* generally tend to increase the "structural unemployment rate" (see, for example, Blanchard and Wolfers, 2000; Bassanini and Duval, 2006; Nickell et al., 2005). It should be noted that recent literature on the real impact of financial crises emphasizes the medium term effects (e.g. IMF, 2009, chapter 4; Furceri and Mourougane, 2009; Boyd et al., 2005; Cerra and Saxena, 2008).

2.3 An overview of the key effects on labour markets of the recent global crisis

The last crisis began as financial crisis at the end of 2007; its deepest impact on financial markets (with Lehman Brothers default) was in September 2008, when the real effects initially developed (but the deepest fall in production was reached in the first half of 2009) and led to increasing unemployment rates during 2009.

As noticed in the Introduction, the real effects (on output, income, etc.) of financial crises are always *lagged* and the labour market effects are even more lagged. According to IMF (2010, chapter 3), the responsiveness of the unemployment rate to changes in output has increased over time in many countries, due to less strict employment protection and greater use of temporary employment contracts. [12] However, it has been estimated (see page 26) that in normal recessions it takes three quarters after

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[11] This occurred also in China at the outset of the last crisis.

[12] This responsiveness should help also when the recovery will become stronger.

output has started to recover for employment to start increasing and an additional two quarters for the unemployment rate to peak.[13]

As for the next years, in addition to a further rise in the unemployment rates (with top values to be achieved in the first months of 2010), it is also likely, similarly to past crises, a certain degree of *persistence* of unemployment rate in the subsequent years, due to phenomena of "hysteresis" (upward shift in the "structural unemployment")[14].

A first general result of empirical studies is that the unemployment dynamics after the 2007-08 financial crisis and 2008-09 global recession is (and will be) very different across countries. Many studies (see, for example, The Conference Board, 2009; European Commission, 2009a and 2009b) suggest that the real (and labour) impact widely differs across (group of) countries and regions and depends upon various factors: e.g. country reliance on international trade, dependence on natural resources, financial liberalization of banking system, fiscal resources at government disposal, in addition to the mentioned differences in institutional conditions and in the working of labour and output markets.

As for labour market impact, IMF (2009)[15] investigates the different *employment adjustments* and labour hoarding phenomena with respect to previous crises. It seems that in most countries, both emerging and advanced (the most significant exception being the US) there has been a much *bigger* (negative) *impact on productivity* (per worker), suggesting that *labour hoarding* has been much higher (on average) during this recession. A more recent contribution (Arpaia and Curci, 2010) analyzes in depth the labour market impact of the crisis for the EU-27 countries.

Let us now comment on some recent data (of international institutions) concerning the labour market impact of the last crisis. In 2008-09, unemployment rates and working poverty have significantly increased in all world regions (see also Table A1 in Appendix), while net job destructions occurred in two regions (Developed Economies and EU, Central and South Eastern Europe); however, a decline in employment growth was recorded in all world regions . The highest increases of *unemployment* resulted in developed economies, the EU and the remaining countries of Europe, with a further increase in unemployment[16] foreseen for 2010 (particularly in Developed Economies and the EU). On the other hand, *working poverty* dramatically increased in many regions, especially South East Asia and the Pacific, South Asia, North Africa, and Sub Sahara Africa.

Concerning *developed countries*, Figure A1 (in Appendix) shows the total increase in the unemployment rate during the last "Great Recession", which is associated to the "peak-to-through" decline in output. It is clear that the relation between the two variables is not perfect: in particular there are some countries (Japan, Germany, Italy) where the deterioration of the unemployment rate has been slight, despite a deep recession. A possible explanation will be given at the end of this Section.

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[13] Moreover, these lags are longer if the recession comes together a financial crisis. It should also be noted that unemployment can still rise (for a period) even after employment growth has turned positive.

[14] Persistence and hysteresis largely depend on the robustness of recovery, also related to the adoption of macroeconomic policies and of specific labour market policies.

[15] For an update, that particularly stresses the cyclical behaviour of unemployment during recessions and recoveries, discussing the initial (and expected) labour market impact of the last crisis, see IMF (2010, chapter 3).

[16] In many regions and in the world as a whole, unemployment rate will remain more or less steady. This will occur even if real growth will change from negative to positive: the rate of GDP increase was –0.6% in 2009 and is forecasted to reach +4.2% in 2010, for the world economy (-3.2% and +2.3% respectively for the advanced economies); see IMF (2010).

If we focus on *EU countries* more detailed data are available. In the EU-27 as a whole, the *employment rate* – the key labour market performance indicator of the European Employment Strategy – declined in 2009 (at 64.6% with respect to 65.9% in 2008), interrupting its previous rise toward the Lisbon objective (70%). The level of EU-27 *unemployment* reached 23.1 millions in March 2010, with respect to 20.6 of 12 months before and 16.8 million for average 2008; the unemployment rate forecast for 2010 is 9.8% (almost 3 points more than the 7.0% of 2008). [17]

With reference to individual countries, in Table A2 (in Appendix) past, present and expected (for 2010 and 2011) national evidences on *unemployment rates* are shown for "old" EU countries, new EU transition countries[18], US and Japan. Remarkable differences emerge, but a general upward shift is very clear for 2009 and 2010 (a high degree of persistence is expected for 2011).

The highest increases in the unemployment rates are expected in 2010 (EC Spring forecasts) in the United States, Ireland and Spain are examples of huge (up to 9.7%, 13.8% and 19.7% for the mentioned countries): employment has been (and will be) cut deeply, helping to maintain labour productivity, but at the cost of the above increases in unemployment. On the opposite side, other countries (like Germany, the Netherlands, Denmark and Italy) experimented (and are expecting) less remarkable (un)employment effects; possible reasons are the subsidies for part-time work, like in Germany, or income support for workers formally maintaining job contracts at reduced working-time or at "zero-hours", like in Italy. In the latter countries, especially in Italy, the fall in labour demand has been also accompanied by a reduction in labour supply – the "*discouraged worker effect*" – thus dampening down the impact on unemployment rates.

IMF (2009) partly explains the above mentioned heterogeneity by considering the multifaceted dimensions of labour market flexibility, such as employment protection legislation (EPL), the types of wage-bargaining arrangements, the level and duration of unemployment benefits, the diffusion of temporary contracts. The stronger employment response in low EPL economies, relative to medium/high EPL economies, is consistent with the literature suggesting that employment protection reduces both inflows to and outflows from employment. For medium/high EPL countries, the reduction in employment during this crisis has been similar to that during previous cycles despite substantially bigger GDP declines, confirming the above mentioned higher degree of labour hoarding[19].

As a final remark, it is interesting to note that the ranking of countries in terms of labour market impact is closer to the ranking according to the timing and intensity of the

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[17] It should be noted that, within Europe, the last "job shock" hit both "old EU" and "new EU" countries in a impressive way, but this happened after almost two decades of quite different trends in labour market performance. In fact, "old EU" countries - especially since mid 1990s - experimented a significant net job creation accompanied by low productivity growth (moving towards an extensive model of growth), while "new EU countries" shifted, quite abruptly, from an "extensive model" (under central planning) with high employment rates (for both male and female) to a more "intensive model of growth" (see Marelli and Signorelli, 2010b).

[18] In transition countries, the current and expected general increases - particularly pronounced in the three Baltic Republics - abruptly inverted the previous positive trend, producing a new (second) "unemployment boom" comparable to that prevailing in the first decade of transition (as to long-run trends in transition countries, see Marelli and Signorelli, 2010a):

[19] Because of hiring and firing costs, the firms may be willing to hoard labour if the shock hitting the economy looks transitory. However, as a recession deepens, firms may consider the shock to be more persistent and may start to fire at a faster pace.

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initial impact of the financial crisis rather than to the one concerning other real effects (on production, income, etc.). In the world, financial crisis harmed initially the US, the UK, Ireland, Spain and smaller countries (Iceland, Greece, the Baltic States). On the contrary, the biggest output (real GDP) reductions in 2009 have been recorded in Japan, Germany, and Italy (GDP fall was around 5% in all three countries); this is a consequence of world trade contractions, affecting more deeply industrial and export-oriented countries.

Still different is the impact on (un)employment, with the biggest effects on the US, Ireland and Spain (as just seen above). A possible explanation is that labour-hoarding practices are more common in countries specialised in industrial activities, where income-support policies are also more effective, because a gradual – although sluggish – return to previous production levels is likely. On the contrary, it is possible that some non-manufacturing activities (many services but also construction) will be definitely abandoned in the countries where "financialisation" had reached the most upsetting forms, e.g. with the explosion of private debt (in the UK, Ireland, Spain, etc.); in those countries, the labour market impact has anticipated the likely future trends. The impact on labour has been deep also in countries where the overall macroeconomic stability was low, such as some transition and developing countries.

2.4 The impact of the crisis on specific segments, especially on women

The impact of the crisis has been differentiated not only across countries, but also between the various segments of the labour market.

Concerning *young workers*, it should be noted that a decrease in labour demand implies fewer job openings, so young people (new entrants with high "experience gap") are particularly affected. Moreover, job destructions are also likely to disproportionately affect young workers, because they tend to work more frequently under temporary contracts.

After the last crisis, many researches (see e.g. ILO, 2010) agree that the crisis will result in the *extension of gender inequality and poverty*. Antonopoulos (2009) suggests that with global recession there will be an increase in gender disparity and poverty among women, especially in developing economies; in fact, with the decline in textile and agricultural exports, unemployment among women will increase. Moreover, *female* workers' share in informal sector and in vulnerable low paid jobs is also expected to rise worldwide.

On the contrary, in the case of some developed economies[20] (especially those directly hit by the crisis or more export oriented), the last crisis mainly affected sectors with a higher presence of male employment (e.g. constructions and manufacturing) producing a different gender impact with respect to past crises (European Commission, 2009b).

In any case, the gender specific impact of the crisis cannot be ignored. This impact comes on top of long-term gender specific inequalities in labor markets, that of course are highly different in world countries and regions, because of the various norms about role of men and women in economy and society (see again Sperl, 2009). The

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[20] There is wide empirical evidence. For example, in case of Australia (see Richardson, 2009) the recession has not affected women's unemployment as seriously as it has men's; rather, women faced chronic difficulties in the labour market (see section 2.1), that are exacerbated by the recession.

current situation of female labour participation rates and female unemployment rates can be grasped from Figures A2 and A3 in Appendix.

However, a better account of the impact of the crisis on women is shown by Figure 1. It is apparent that the female unemployment rate (UR) has increased in the world as a whole, but at the end of 2009 it had "almost" returned to pre-crisis levels. In developed countries, on the contrary, after increasing by about 1/3, it remains significantly higher compared to pre-crisis levels.

Figure 1: Female Unemployment Rate
Percentage change over the same period of previous year

Data Source:Glabal Employment Trends
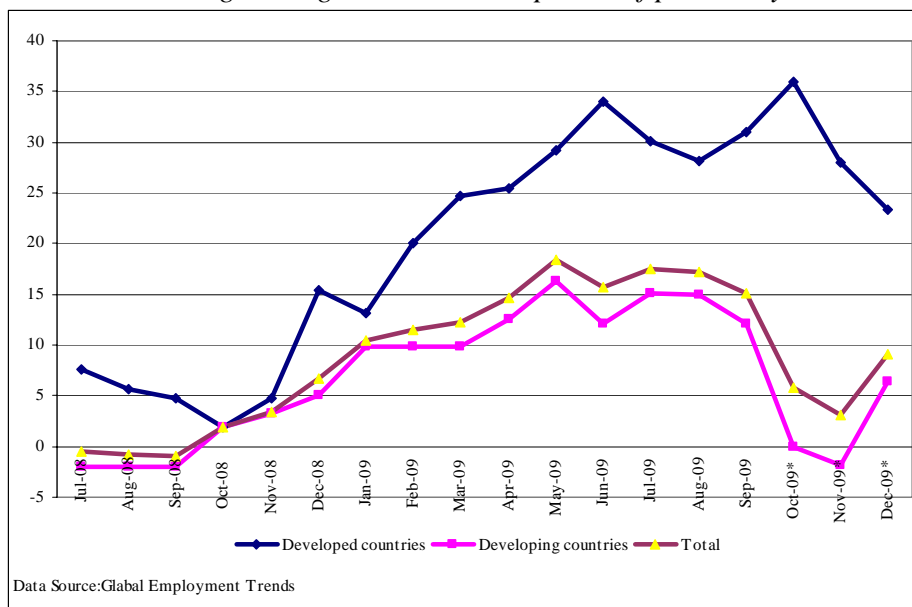
The relative impact on female UR vs. male UR can be discussed with reference to EU data. First of all, we can observe that, according to available data[21] huge and different increases in *total unemployment rates* are shown by EU-27 countries (Table 1).

Total UR increased in EU-27 at 9.6% in March 2010 with respect to 7.1% in September 2008; the final level is almost identical to US' (9.7%). Among the bigger countries, the smallest increases were observed in Germany (from 7.1% to 7.3%), Belgium (from 7.3% to 8.1%) and Italy (from 6.8% to 8.8%), while the highest increases were recorded in Latvia (from 8.1% to 22.3%), Estonia (from 6.5% to 15.5%), Spain (from 12.4% to 19.1%) and Ireland (from 6.7% to 13.2%).

In the same period, *youth* UR (15-24) increased from 15.8% to 20.6% (with extremely high rates in Spain and Latvia, 41.2% and 44.9% respectively; the other Baltic states, Slovakia and Italy follow in this ranking. As to *female* UR, it increased in EU-27 from 7.5% to 9.4%, but male UR increase was even higher, from 6.8% to 9.8%.[22]

The poorer performance of *male* workers, in European countries, contrasts with world trends: according to ILO (2010), female unemployment rate increased (2008-09)

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[21] Eurostat, April 30, 2010.
[22] It should be noted the absolute decrease in female UR in Germany and the slight increases in Austria, Belgium, Finland, the Netherlands, the UK.

from 5.6% to 6.3% for males and from 6.1% to 7% for females, thus showing a slightly deeper impact on women for the world as a whole. Only in Central and South-Eastern Europe (among the regions analysed by ILO) was the impact heavier on males. The smaller impact of the crisis on women in some regions or countries (including some EU countries) probably reflects the sectoral and international specialisation of individual countries, but also a probable more intense "discouragement effect" among women.

Table 1 - Unemployment rates (total, female and youth) September 2008 versus March 2010

	Total UR			Female UR			Youth UR	
	Sept. 2008	*March 2010*		*Sept. 2008*	*March 2010*		*Sept. 2008*	*March 2010*
Belgium	7.3	8.1		7.9	8.0		19.9	24.2
Germany	7.1	7.3		7.0	6.7		9.5	10.0
Ireland	6.7	13.2		5.2	8.9		14.2	27.9
Greece	7.5	10.2***		11.2	13.9*		22.0	27.5****
Spain	12.4	19.1		13.8	19.1		26.2	41.2
France	8.0	10.1		8.5	10.4		19.8	22.1
Italy	6.8	8.8		8.5	10.2		21.3	27.7
Cyprus	3.5	6.7		4.2	6.9		8.7	17.8
Luxembourg	5.1	5.6		5.9	6.5		18.3	18.0
Malta	5.8	6.9		6.2	7.2		11.2	14.8
Netherlands	2.7	4.1		2.8	4.0		5.2	7.4
Austria	3.9	4.9		4.1	4.4		7.9	10.1
Portugal	7.8	10.5		9.2	11.2		17.3	21.4
Slovenia	4.1	6.2		4.3	6.3		10.2	12.2
Slovakia	8.9	14.1		10.3	14.2		19.2	33.3
Finland	6.5	9.0		6.7	8.1		17.0	23.7
Euro area	7.7	10.0		8.4	10.1		15.7	19.9
Bulgaria	5.2	8.7		5.2	7.9		11.2	22.5
Czech Rep.	4.3	7.9		5.6	8.7		10.3	21.7
Denmark	3.4	7.6		3.7	6.5		8.3	14.2
Estonia	6.5	15.5***		5.6	11.2*		14.3	32.0****
Latvia	8.1	22.3		7.6	17.5		12.9	44.9
Lithuania	6.3	15.8***		5.9	11.8*		14.9	30.4****
Hungary	7.8	11.0		7.9	10.5		20.0	28.4
Poland	6.8	9.1		7.7	9.2		16.6	23.6
Romania	5.8	7.6***		4.7	6.8*		18.6	20.4****
Sweden	6.4	8.7		6.7	8.6		20.5	26.0
U.K.	6.0	7.8**		5.3	6.7**		15.8	19.7**
EU-27	7.1	9.6		7.5	9.4		15.8	20.6
US	6.2	9.7		5.5	8.6		13.4	18.8
Japan	4.0	4.8*		3.8	4.4*		-	-

Note: * February 2010; ** January 2010; *** December 2009; **** Q4 2009.
Source: Eurostat, December 1, 2009. Seasonally adjusted unemployment rates.

3. Gender impact of past financial crises: some econometric investigations

In this section we have used a cross country panel estimation approach to quantify the relationship between financial crises and female economic participation in the labor markets as well as on unemployment rates.

3.1. Data and model

Our empirical analysis focuses on female labour force participation rates (*FLFPR*) and on female unemployment rates (*FUR*). According to the International Labor Organization (ILO), the organization from which the data were extracted, a woman is economically active if she is employed or actively seeking work. The female labor force participation rate is defined as the number of economically active women belonging to a working age population divided by the total female population in that age group. In alternative specifications we shall use the unemployment rate.

The sample countries (see the list in Table A3 in Appendix) vary from 64 to 86 depending upon the availability of data for explanatory variables.

The estimation procedure employs unbalanced panel data to fully utilize the available information for the period 1980-2005. The baseline model for estimation is:

$$FLFPR_{it} = Crisis_{it}\,\beta + Z_{it}\,\mu + \varepsilon_{it} \qquad (1)$$

where, $FLFPR_{it}$ represents female labor force participation rate in country i at time t and it is our dependent variable. $Crisis_{it}$ is representing our measure of financial crisis. Z_{it} is a vector of control variables and ε_{it} is the error term. In alternative specifications, the unemployment rate (UR_{it}) is included, in place of $FLFPR_{it}$.

Data on our key explanatory variable (*financial crisis*) is taken from the Honohan and Laeven (2005). These data have already been explained (in section 2.2) and alternative definitions of crises are also presented in Table A4 (in Appendix). For sensitivity analysis and robustness check, we have also used the *other measures of crisis*, which represent any kind of crisis (banking, currency and debt) in an economy; data are taken from Laeven and Valencia (2008). Systemic banking crisis is a variable which takes a value of one if there is a crisis in a country and zero otherwise. Similarly, the currency crisis and debt crisis variables take a value of one if there is a crisis and zero, otherwise.

For including *control variables*, we take guidance from previous literature (e.g. Jacobsen, 1999). Our control variables include capital stock per worker, inflation rate, foreign direct investment and openness. Capital stock per worker data are taken from United Nation Industrial Development Organization (UNIDO) database. Data on our other control variables are taken from World Bank Development Indicators (WDI) historical database. Adjusted inflation[23] rate is used as a proxy for the changes in the price level in the country.

The summary statistics of our dependent and main explanatory variables are provided in Table A5 in Appendix. Table A6 in the Appendix shows the correlation matrix of our variables. The low correlations of the explanatory and control variables suggest that multi-collinearity is not a problem in our estimations.

3.2. Econometric results on female participation rates

We estimate equation (1) using a random effects panel model over the period 1980-2005, for a panel of 64 countries. Random effects model has been selected on the basis of Hausman test. Results of empirical estimation are presented below in Table 2. In

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[23] To adjust for extreme movements, we modify the inflation rate (P) as $\dfrac{P/100}{1+(P/100)}$.

the first model, we simply evaluate the *impact of financial crises on female participation rate* (FLFPR). We observe that the "crisis" coefficient is negative and statistically significant. This result implies that financial crisis leads to a decline in female participation rate.

We incorporate capital stock per worker as an explanatory variable in Model 2. As expected, the coefficient of the *capital stock per worker* is positive and significant, which shows that it impacts the participation rate positively. This variable is also capturing the level of economic development in a particular country. The impact of crisis remains negative and significant.

We incorporate, in Model 3 to Model 5, the other control variables which may impact the participation rate. Coefficients for *inflation* and *FDI* variables result positive and significant and, especially, their inclusion does not change the sign and significance of the key explanatory variable. Finally, in Model 6 we include all variables from Model 1 to Model 5 and find that results remain very consistent. Financial crisis is our main variable of interest and its *impact remains negative and significant* in all specifications suggesting the robustness of our findings.

Table 2 - Impact of Crisis on Female Participation Rate							
Dependent variable: Female Participation Rate							
Variables		Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Financial Crisis	Coefficient	-0.748***	-0.870***	-0.741**	-0.899***	-0.896***	-0.829***
	Robust SE	0.261	0.288	0.291	0.299	0.295	0.306
Capital stock per worker	Coefficient		0.149***	0.140***	0.141***	0.150***	0.134***
	Robust SE		0.008	0.008	0.009	0.009	0.009
Inflation	Coefficient			-6.757***			-6.469***
	Robust SE			1.085			1.129
Foreign direct Investment	Coefficient				0.168**		0.145**
	Robust SE				0.067		0.061
Openness	Coefficient					0.005	0.009
	Robust SE					0.008	0.01
Constant	Coefficient	56.672***	47.107***	48.295***	47.061***	46.934***	47.828***
	Robust SE	1.677	2.095	2.076	2.103	2.179	2.216
Hausman test		0.01	7.21	6.69	6.02	9.7	9.23
P-value		0.92	0.02	0.08	0.11	0.12	0.11
No of observations		2070	1449	1420	1401	1416	1355
Number of Groups		90	69	69	69	68	68
R-Square		0.004	0.137	0.169	0.162	0.132	0.0185
Wald-chi2		1155.66***	10.99.75**	369.99***	360.64***	316.412***	381.685

Source: Authors Calculations

Note: * Significant at 10%, ** significant at 5 %, *** significant at 1 %

3.2. Econometric results on female participation rate by income groups

As a sensitivity analysis, we replicate the previous exercise for a sample of *high income OECD countries* (HYE) and *other countries* (excluding high income OECD countries). The results are presented in Tables 3 and 4. The crisis impact is still negative

for participation rate both in high income OECD as well as for other countries. However, it is statistically significant only in case of high income OECD countries. For the "other countries" sample, the crises coefficient is only significant in Model 4, and partially significant in Models 1-3, not in Model 5 (i.e. with the full set of controls). The value of coefficient is also higher in high income OECD sample countries as compared to other countries sample results (Table 4).

Table 3 : Impact of Crisis on Female Labor Force Participation Rate in High Income OECD Countries						
Dependent variable: Female Labor Force Participation Rate						
Variables		Model 1	Model 2	Model 3	Model 4	Model 5
Financial Crisis	Coefficient	-1.583***	-1.514***	-1.496***	-1.380***	-1.260***
	Robust SE	0.364	0.362	0.347	0.371	0.351
Capital stock per worker	Coefficient	0.199***	0.183***	0.192***	0.190***	0.170***
	Robust SE	0.009	0.01	0.009	0.009	0.011
Inflation	Coefficient		-11.372***			-10.395**
	Robust SE		4.231			4.05
Foreign direct Investment	Coefficient			0.040*		0.023
	Robust SE			0.023		0.025
Openness	Coefficient				0.041**	0.040**
	Robust SE				0.017	0.017
Constant	Coefficient	37.949***	40.221***	38.707***	36.226***	38.926***
	Robust SE	2.667	2.786	2.741	2.819	3.01
No of observations		420	420	416	420	416
Number of Groups		20	20	20	20	20
R-Square		0.581	0.588	0.602	0.588	0.614
Wald-chi2		551.914***	567.534***	597.745***	566.431***	625.194***

Source: Authors Calculations

Note: Robust standard errors in parentheses. * Significant at 10%, ** significant at 5 %, *** significant at 1 %

Table 4 : Impact of Crisis on Female Labor Force Participation Rate in Non-OECD Countries						
Dependent variable: Female Labor Force Participation Rate						
Variables		Model 1	Model 2	Model 3	Model 4	Model 5
Financial Crisis	Coefficient	-0.774**	-0.642**	-0.773**	-0.845***	-0.586*
	Robust SE	0.317	0.32	0.325	0.327	0.333
Capital stock per worker	Coefficient	0.040*	0.024	-0.002	-0.03	-0.119***
	Robust SE	0.021	0.022	0.027	0.03	0.042
Inflation	Coefficient		-6.747***			-5.541***
	Robust SE		1.028			1.101
Foreign direct Investment	Coefficient			0.610***		0.545***
	Robust SE			0.078		0.09
Openness	Coefficient				0.023**	0.013
	Robust SE				0.01	0.011
Constant	Coefficient	50.769***	52.055***	50.400***	50.686***	52.687***
	Robust SE	2.648	2.654	2.653	2.679	2.746
No of observations		1029	1000	985	996	939
Number of Groups		49	49	49	48	48

R-Square		0.01	0.05	0.07	0.01	0.10
Wald-chi2		9.695***	51.469***	69.056***	10.522**	100.203***

Source: Authors Calculations

Note: Robust standard errors in parentheses. * Significant at 10%, ** significant at 5 %, *** significant at 1 %

This implies that financial crises impact for women in high income economies is more severe as compared to other countries in the sample. This may be due to the fact that women in high income economies are working in formal sectors and mostly employed in non-farm activities; on the contrary, in low income and developing economies mostly females are working in agriculture sector (often under the category of "unpaid family helpers").

To investigate more in detail the severity of financial crisis for *economies at different development levels*, we rearrange our countries in four income groups plus a fifth group of 15 transition countries (Table A1 in Appendix). To identify the four income groups, income categorization is made in accordance with the World Bank Development indicators ranking. Our estimates refer to the complete model including all control variables. The results are presented in Table 5 below, but special caution is needed in explaining these results as number of observations declined significantly.

The impact of crisis is negative and statistically significant only in case of high income economies (HIE) and upper middle income economies (UMYE). In the other two lower income groups – lower middle income economies (LMYE) and low income economies (LYE) – the coefficients have positive sign but are not significant. This is may be due to the following three reasons: (i) persistence of high poverty levels in these economies that leads people to work even for very low paid jobs (in vulnerable situations for their survival); (ii) high levels of under-employment; and (iii) poor data collection methods and non reliable data quality.

Table 5: Impact of Crisis on Female Labor Force Participation Rate by different Income Groups					
Dependent Variable: Female Participation Rate					
		HYE	UMYE	LMYE	LYE
Variables					
Financial Crisis	Coefficient	-1.260***	-2.463***	-0.083	0.354
	Robust SE	0.326	0.851	0.58	0.22
Capital stock per worker	Coefficient	0.169***	-1.184***	-0.462***	1.058***
	Robust SE	0.01	0.059	0.094	0.154
Openness	Coefficient	0.040***	0.065***	0.039***	-0.027***
	Robust SE	0.017	0.017	0.019	0.005
Foreign direct Investment	Coefficient	0.023	0.536***	1.025***	-0.027
	Robust SE	0.018	0.172	0.181	0.003
Inflation	Coefficient	-10.39***	-11.59***	-0.28	1.24***
	Robust SE	4.12	2.31	1.15	0.485
Constant	Coefficient	38.92***	49.00***	45.19***	65.19***
	Robust SE	2.76	4.33	3.77	4.29
No of observations		416	210	426	279
Number of Groups		20	10	21	15
R-Square		0.61	0.29	0.16	0.28

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| Wald-chi2 | | 705*** | 250.35*** | 62.10*** | 144*** |

3.3. Econometric results on female participation rates of different types of crisis

For further *robustness check* we play around with the *definition of crisis* and evaluate its impact on participation rate. Estimation results of our sensitivity analysis are presented below in Table 6. In Model 1, we use the "*crisis 2*" (sum of bank crisis, currency crisis and debt crisis) which measures the impact of any kind of crisis on LFPR. Findings remain the same: crisis depresses the female participation rate. Similarly we evaluate the impact of *currency crisis* and *debt crisis* separately in Model 2 and Model 3. Both currency crisis and debt crisis impacts are negative, although more statistically significant in the case of debt crisis. However, the coefficient of banking crisis is not significant. Notice that the coefficient value is highest in the case of debt crisis.

Table 6 - Impact of Crisis on Female Participation Rate - Sensitivity Analysis					
Dependent Variable: Total Female Participation Rate					
Variables		Model 1	Model 2	Model 3	Model 4
Crisis 2	Coefficient	-0.830***			
	Robust SE	0.307			
Currency Crisis	Coefficient		-0.814*		
	Robust SE		0.482		
Debt Crisis	Coefficient			-2.661***	
	Robust SE			0.838	
Banking Crisis					-0.406
					0.522
Capital stock per worker	Coefficient	0.133***	0.132***	0.132***	0.132***
	Robust SE	0.012	0.012	0.012	0.012
Openness	Coefficient	0.008	0.009	0.007	0.008
	Robust SE	0.009	0.009	0.009	0.009
Foreign direct Investment	Coefficient	0.148***	0.150***	0.148***	0.149***
	Robust SE	0.033	0.033	0.033	0.033
Inflation	Coefficient	-6.212***	-6.271***	-6.511***	-6.585***
	Robust SE	0.972	0.982	0.962	0.963
Constant	Coefficient	47.759***	47.734***	47.882***	47.788***
	Robust SE	2.167	2.179	2.094	2.179
No of observations		1355	1355	1355	1355
Number of Groups		68	68	68	68
R-Square		0.184	0.181	0.185	0.179
Wald-chi2		282.312***	277.138***	284.099***	274.378***

3.4. Econometric results on female unemployment rate

In addition to economic participation indicator, it is useful to econometrically investigate the *impact of financial crises on female unemployment rate*. As for these

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estimations we exploit the historical data base of World Bank Development indicators and the results are presented below in Table 7. The financial crisis coefficient is positive and partially significant which implies that crises leads to high unemployment rate (Model 1). To check the *persistence of adverse effects* of crisis on unemployment rate, we take the lagged value of crisis as an explanatory variable (see Model 2 to Model 7). An important thing to note is that intensity of adverse effects of crisis on unemployment rate is highest in second and third year after financial crisis, where the coefficients are also highly significant. The adverse effect of crisis on unemployment disappears after five years subsequent to crisis.

Table 7 - Impact of Crisis on Female Unemployment Rate								
Dependent variable: Female Unemployment Rate								
Variables		Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Capital stock per worker	Coefficient	-0.022***	-0.029***	-0.034***	-0.036***	-0.038***	-0.036***	-0.035***
	Robust SE	0.008	0.008	0.008	0.008	0.008	0.01	0.012
Inflation	Coefficient	-0.003	-0.009	-0.011	-0.005	-0.001	-0.012	-0.018*
	Robust SE	0.009	0.009	0.009	0.01	0.009	0.01	0.011
Foreign direct Investment	Coefficient	-0.105***	-0.095***	-0.092***	-0.091***	-0.080***	-0.062**	-0.048**
	Robust SE	0.037	0.035	0.034	0.033	0.03	0.026	0.022
Openness	Coefficient	-6.348***	-6.611***	-6.255***	-5.849***	-5.415***	-5.633***	-3.389**
	Robust SE	1.212	1.174	1.16	1.15	1.221	1.29	1.64
Financial Crises	Coefficient	0.586*						
	Robust SE	0.339						
Financial Crisis (-1)	Coefficient		1.167***					
	Robust SE		0.309					
Financial Crisis (-2)	Coefficient			1.156***				
	Robust SE			0.299				
Financial Crisis (-3)	Coefficient				0.851***			
	Robust SE				0.264			
Financial Crisis (-5)	Coefficient					0.500*		
	Robust SE					0.282		
Financial Crisis (-7)	Coefficient						-0.930***	
	Robust SE						0.272	
Financial Crisis (-10)	Coefficient							-1.543***
	Robust SE							0.341
Constant	Coefficient	12.441***	12.937***	13.334***	13.090***	12.898***	14.164***	14.494***
	Robust SE	1.232	1.285	1.313	1.341	1.315	1.4	1.513
No of observations		812	789	767	740	683	616	501
Number of Groups		59	59	59	59	59	58	58
R-Square		0.059	0.089	0.094	0.086	0.08	0.099	0.098
Wald-chi2		39.475***	57.330***	65.494***	67.511***	49.241***	54.517***	47.236***

Source: Authors Calculations

Note: Robust standard errors in parentheses. * Significant at 10%, ** significant at 5 %, *** significant at 1 %

Notice that the first-round effect of the financial crisis on the unemployment rate is positive and partially significant, only thanks to the situation in developed (OECD) countries, since in developing (non-OECD) countries no significant effects can be detected. This comparison is clearly shown by the two sets of estimations, concerning

respectively OECD and non-OECD countries (see Tables A7 and A8 in Appendix).[24] Thus, the higher significance of the effects in case of developed countries is consistent with what we found for participation rates (Section 3.2).

A sensitivity analysis applied to female unemployment rates shows that currency crisis are probably the type of crisis that affect more significantly such unemployment rates (Table A10 in Appendix).

Now, a more fundamental question arises. Are female workers more or less hurt by financial crises? For comparison purpose we also evaluate the crisis impact on overall unemployment rate[25]. Our results show that crisis adverse impact on female unemployment rate is higher as compared to overall unemployment rate. This finding implies that crisis leads – according to past evidence – to a worsening of the gender gap situation.

However, we have seen (Section 2.4) that the preliminary evidence of the last crisis is somehow different, since in many countries the deepest effects have been felt by male unemployment rates, probably because of "discouraged worker effects" that are greater in case of women. Instead of being officially defined as unemployed, women are more likely to move out of the labour market. This is any case also coherent with our empirical results, that seem more robust in case of participation rates (compared to unemployment rates).

4. Final remarks and policy implications

The empirical part of this study investigated the effect of financial crises on female participation and female unemployment rates during the period 1980-2005 for a large number of countries (from 64 to 86). The estimation technique consists in a random effects panel model. The empirical study focused also on alternative definitions of crisis and on the differentiated impact by group of countries, according to their income level. Labour markets in economies belonging to diverse income groups respond differently at the wake of financial crises; in particular, empirical analysis shows that financial crisis impact on female participation rate is negative and significant only in case of high income and upper middle income economies.

Considering the different specifications, the results in terms of participation rates seem more robust than the estimations referred to the unemployment rates. A possible explanation is that, following financial crisis, many women decide to retire from the labour market, at least from formal activities: this is the well-known "discouraged worker" effects; it accounts for the smaller impact of unemployment rates.

The analysis of *female unemployment rate* is however interesting: in addition to the confirmation of a greater impact on such rates compared to overall unemployment rates, provides information about the persistence and severity of crisis impact for women. In fact, female unemployment rates increase rapidly in second and third year of crisis (this adverse effect on unemployment rate disappears after five years from the crisis).

To summarize, *financial crisis impact on labour market indicators is significant*: it negatively affects the female participation rate and worsens the situation of the

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[24] A more detailed disaggregation of countries, in four income groups (se Table A9 in Appendix), shows that also "lower middle income" countries are significantly affected – in terms of female unemployment increases – by the crisis.

[25] Estimation results are not presented here but are available on request. See also Choudhry-Marelli-Signorelli (2010), that estimate the effects on total unemployment (and employment) rates.

unemployment rate. Thus, our econometric results allow us to have an indirect idea about the impact of the 2007-08 financial crisis on the labour market, although we are fully aware of the peculiarities of the last crisis, its global nature in the first place.

Concerning the main characteristics of the last crisis, we have seen that, in most regions and countries of the world, employment growth has strongly decelerated or declined and unemployment has generally risen. The worst effects of the crisis are probably felt just now (in 2010), because of the mentioned lags between the financial crisis, the initial real effects (on production and income) and the subsequent effects on labour demand (that in the short run are less sizeable due to labour hoarding practices); moreover, the negative impact on unemployment is likely to persist over time because of hysteresis effects. This is particularly manifest in developed countries and the EU, while developing countries suffer much more because of huge working poverty.

The impact was deeper on the weakest sections of the labour market: young people (who are the first segment generally hurt because of the less stable jobs and fewer job openings impinge especially on new entrants, lacking skills and experience), women, old workers (who are often unable to find alternative jobs), with a widespread increase in vulnerable employment as well.

Public policies have generally followed two key approaches: (i) to provide huge *fiscal stimuli* to sustain, through government expenditures, consumption, aggregate demand and production (as already suggested by the G-20)[26]; (ii) following *"passive" labour market policies*, to sustain the income of the unemployed (or workers risking to be fired).

On the first point, we can observe that the timing of the exit strategies is crucial (see also World Bank, 2010). In fact, the scant recovery so far achieved, particularly in Europe, and the restrictive fiscal policies that are required in many countries (after the financial instability characterising sovereign debts in the first part of 2010) will lead to a negligible growth in labour demand in the immediate future.

As to the second issue, it must be stressed that active labour market policies should accompany passive policies; moreover, structural policies will also be needed in countries that were suffering from scant growth (even before the crisis) or unbalanced development. In particular, labour market policies should be directed to two main areas of intervention: (i) to contrast long-term unemployment and persistence effects, by means of appropriate supply-side instruments; (ii) to help the weakest segments of the labour market – e.g. young people and female – that are often the most affected by the crisis. Notice that, while *young* people have been especially hurt by the increase in *unemployment rates* (reaching the level of 30% in some EU countries), *women* have mostly suffered by a fall in *participation rates* (that in some countries were quite low even before the crisis). Active policies are necessary in both developed and developing countries, since the smaller impact of the crisis in the latter (resulting also from our empirical estimates) is probably apparent and related to the increase in vulnerable jobs and informal activities.

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[26] This massive and immediate policy response by all countries – developed and developing – is probably the most significant dissimilarity between the last crisis and the Great Depression. Hence, also the consequences on labour markets will be different (in the '30s the unemployment rate reached the figure of 25% even in the United States).

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Appendix

Table A1 - Labour market impact in world regions

	Unemployment rate					Employment growth				Working poor**		
	2007	2008	2009*	2010*		2000-07	2008	2009*		2007	2008	2009*
World	5.7	5.8	6.6	6.5		1.8	1.4	0.7		21	21.2	24.8
Developed Economies and European Union	5.7	6.0	8.4	8.9		0.8	0.6	-2.5				
Central and South Eastern Europe	8.3	8.3	10.3	10.1		1.3	0.7	-2.2		4.6	4.0	5.3
East Asia	3.8	4.3	4.4	4.3		1.2	0.3	0.9		10.5	11.0	12.6
South East Asia and the Pacific	5.4	5.3	5.6	5.6		1.9	2	1.7		20.9	23.3	27.8
South Asia	5	4.8	5.1	4.9		2.3	2.4	2.2		46.6	45.5	53.5
Latin America and the Caribbean	7.0	7.0	8.2	8.0		2.6	2.2	0.2		6.8	6.6	8.5
Middle East	9.3	9.2	9.4	9.3		3.6	2.2	3.7		8.9	8.1	10.4
North Africa	10.1	10	10.5	10.6		3.3	2.6	2.4		11.2	13.7	15.6
Sub Sahara Africa	8.0	8.0	8.2	8.1		2.9	2.9	2.8		58.9	58.6	63.5

Note: * preliminary estimates (2009) and projections (2010) under "central" scenario (this scenario was generated on the basis of relationship between economic growth and unemployment during the worst economic downturn in each country, by applying this relationship to the IMF GDP growth projections).
** Working Poor (below USD 1.25, share in total employment).
Source: ILO (2010).

*Figure A1 - Change in Unemployment Rates
and Output Declines during the Great Recession*

Source: IMF (2010).

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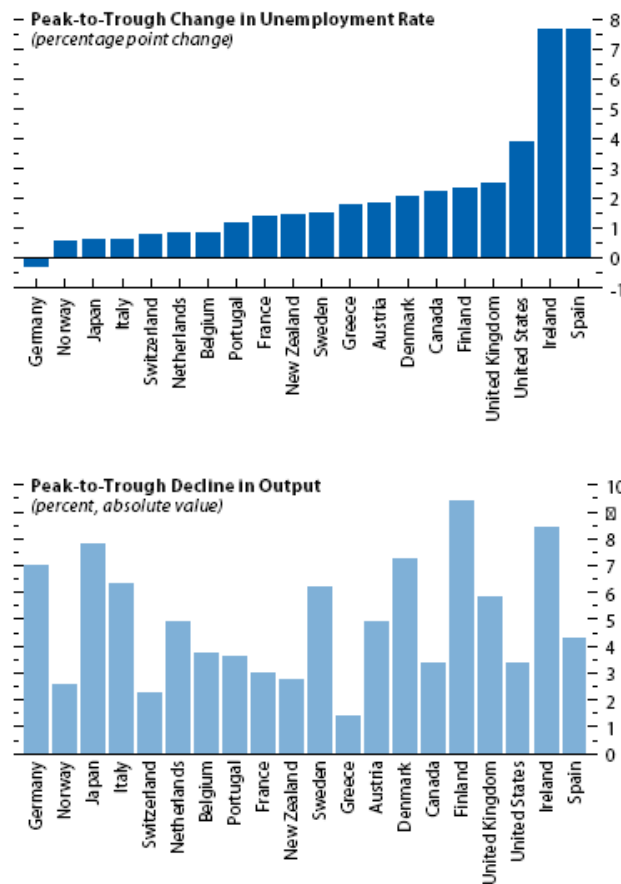
Table A2 - Unemployment rates (five-years or annual averages)

	1992-96	1997-01	2002-06	2007	2008	2009*	2010*	2011*
Belgium	8.9	8.1	8.2	7.5	7.0	7.9	8.8	9.0
Germany	7.8	8.4	9.6	8.4	7.3	7.5	7.8	7.8
Ireland	13.9	6.3	4.5	4.6	6.3	11.9	13.8	13.4
Greece	8.8	10.9	9.9	8.3	7.7	9.5	11.8	13.2
Spain	17.8	13.1	10.1	8.3	11.3	18.0	19.7	19.8
France	11.0	10.0	9.1	8.3	7.8	9.5	10.2	10.1
Italy	10.3	10.6	7.9	6.1	6.8	7.8	8.8	8.8
Cyprus	-	3.9	4.5	4	3.8	5.3	6.7	7.0
Luxembourg	2.7	2.4	4.1	4.2	4.9	5.4	6.1	6.4
Malta	5.2	6.8	7.4	6.4	5.9	6.9	7.3	7.2
Netherlands	6.2	3.4	3.9	3.2	2.8	3.4	4.9	5.2
Austria	3.9	4.0	4.7	4.4	3.8	4.8	5.1	5.4
Portugal	6.2	4.9	6.7	8.1	7.7	9.6	9.9	9.9
Slovenia	-	6.9	6.4	4.9	4.4	5.9	7.0	7.3
Slovakia	-	15.8	16.8	11.1	9.5	12.0	14.1	13.3
Finland	14.9	10.6	8.6	6.9	6.4	8.2	9.5	9.2
Euro area	10.2	9.3	8.7	7.5	7.5	9.4	10.3	10.4
Bulgaria	14.1	16.4	12.6	6.9	5.6	6.8	7.9	7.3
Czech Rep.	-	7.3	7.7	5.3	4.4	6.7	8.3	8.0
Denmark	7.8	4.8	4.8	3.8	3.3	6.0	6.9	6.5
Estonia	-	11.1	8.8	4.7	5.5	13.8	15.8	14.6
Latvia	13.8	14.0	9.8	6.0	7.5	17.1	20.6	18.8
Lithuania	5.0	13.3	10.3	4.3	5.8	13.7	16.7	16.3
Hungary	10.3	7.3	6.5	7.4	7.8	10.0	10.8	10.1
Poland	13.4	13.8	18.1	9.6	7.1	8.2	9.2	9.4
Romania	5.8	6.4	7.6	6.4	5.8	6.9	8.5	7.9
Sweden	8.5	7.1	6.2	6.1	6.2	8.3	9.2	8.8
U.K.	9.1	5.8	5.0	5.3	5.6	7.6	7.8	7.4
EU	9.8	8.8	8.8	7.1	7.0	8.9	9.8	9.7
US	6.3	4.5	5.4	4.6	5.8	9.3	9.7	9.8
Japan	2.8	4.4	4.8	3.9	4.0	5.1	5.3	5.3

Source: European Commission (Spring 2010). Series based on Eurostat definition, based on Labour force survey.

Figure A2: Female Labor Force Participation Rate
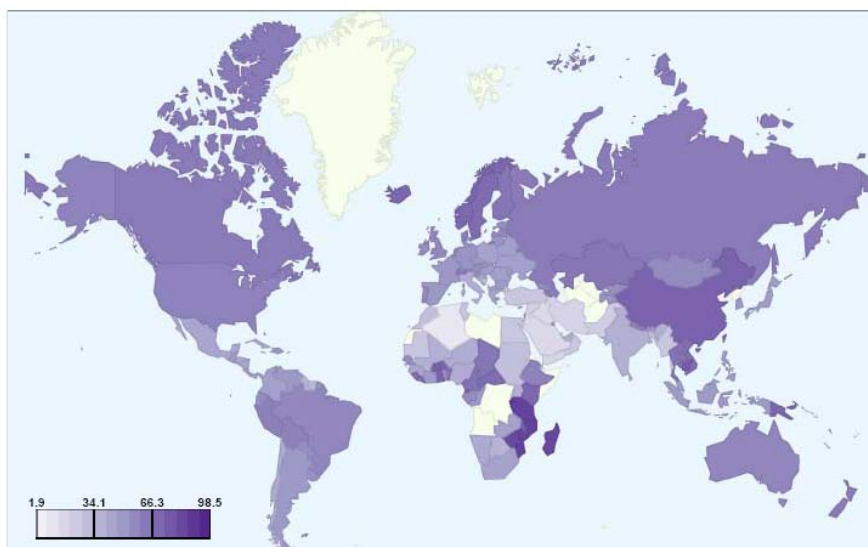*World Map Latest Year*

Figure A3: Female Unemployment Rate
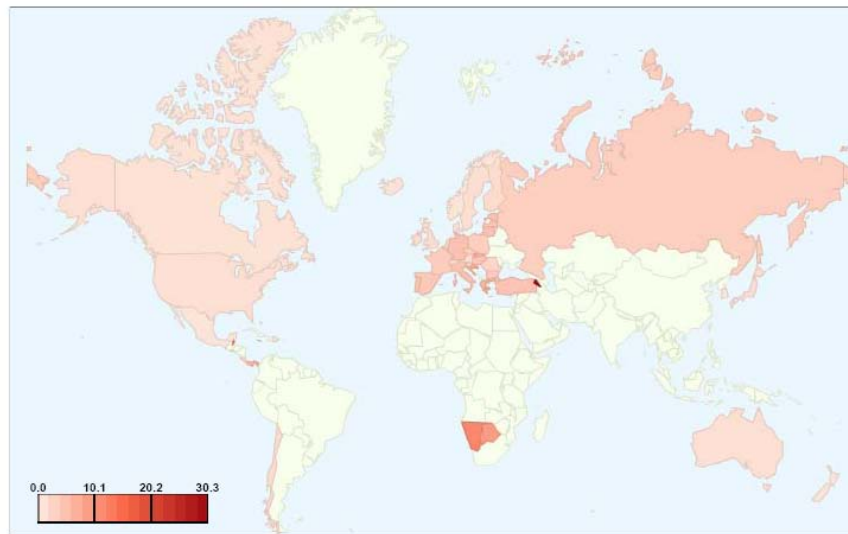*World Map Latest Year*

Table A3: Sample Countries in Empirical Estimation by Income Group					
Sample countries		High Income Economies	Upper Middle Income Economies	Lower Middle Income Economies	Low Income Economies
Albania	Kazakhstan	Austria	Argentina	Algeria	Bangladesh
Algeria	Kenya	Belgium	Chile	Bolivia	Burkina Faso
Argentina	Korea, Rep.	Canada	Costa Rica	Cameroon	Cote d'Ivoire
Australia	Kyrgyz Republic	Denmark	Jamaica	China	Ethiopia
Austria	Latvia	Finland	Malaysia	Colombia	Ghana
Azerbaijan	Lithuania	France	Mexico	Dominican Republic	Kenya
Bangladesh	Madagascar	Greece	South Africa	Ecuador	Madagascar
Belarus	Malaysia	Ireland	Turkey	Egypt, Arab Rep.	Mozambique
Belgium	Mexico	Italy	Uruguay	El Salvador	Nepal
Bolivia	Morocco	Japan	Venezuela, RB	Guatemala	Nigeria
Brazil	Mozambique	Korea, Rep.		India	Pakistan
Bulgaria	Nepal	Netherlands		Indonesia	Senegal
Burkina Faso	Netherlands	New Zealand		Jordan	Tanzania
Cameroon	New Zealand	Norway		Morocco	Uganda
Canada	Nicaragua	Portugal		Nicaragua	Zimbabwe
Chile	Nigeria	Spain		Paraguay	
China	Norway	Sweden		Peru	
Colombia	Pakistan	Switzerland		Philippines	
Costa Rica	Paraguay	United Kingdom		Sri Lanka	
Czech Republic	Peru	United States		Thailand	
Côte d'Ivoire	Philippines			Tunisia	
Denmark	Poland				
Dominican Republic	Portugal				
Ecuador	Romania				
Egypt, Arab Rep.	Russian Federati				
El Salvador	Senegal				
Estonia	Singapore				

Ethiopia	South Africa				
Finland	Spain				
France	Sri Lanka				
Georgia	Sweden				
Germany	Switzerland				
Ghana	Tanzania				
Greece	Thailand				
Guatemala	Tunisia				
Hong Kong, China	Turkey				
Hungary	Uganda				
India	Ukraine				
Indonesia	United Kingdom				
Ireland	United States				
Israel	Uruguay				
Italy	Uzbekistan				
Jamaica	Venezuela, RB				
Japan	Vietnam				
Jordan	Zimbabwe				

Table A4: Data description and Sources		
Variable	Definition	Source
Dependent Variables (alternative)		
Female Labor Force Participation Rate	Active Labor force/Working age population	Key Indicators of Labor market (KILM)
Female Unemployment Rate	female unemployed labor force/ female labor force	World Development Indicators
Key Explanatory Variable		
Financial Crises	It is calculated as a sum of systemic banking crises (when a country's corporate and financial sector experiences a large number of defaults and financial institutions and corporations face great difficulties repaying contracts on time. As a result, non-performing loans increase sharply and all or most of the aggregate banking system capital is exhausted) and non-systemic banking crises (is defined as crises limited to a small number of banks).	Honohan and Laeven (2005)
Control Variables		
Capital stock per worker (CSW)	capital stock available for worker	UNIDO Database
Foreign direct Investment (FDI)	Net inflow of foreign direct investment as percentage of GDP	World Development Indicators
Openness(Open)	Trade of goods and services as percentage of GDP	World Development Indicators
Inflation (Inf)	Consumer Price Index (P) was adjusted for extreme fluctuations as P/100)/[1+(p/100)]	World Development Indicators
Banking Crises	Laeven and Valencia (2008) define a systemic banking crisis when a country's corporate and financial sector experiences a large number of defaults and financial institutions and corporations face great difficulties repaying contracts on time. As a result, non-performing loans increase sharply and all or most of the aggregate banking system capital is exhausted.	Laeven and Valencia (2008)
Currency Crises	Laeven and Valencia (2008) define a currency crisis as a nominal depreciation of the currency of at least 30 percent that is also at least 10 percent increase in the rate of depreciation compared to the previous year.	Laeven and Valencia (2008)

Debt Crises	Sovereign debt crisis is defined as when a sovereign default to private lending or debt is rescheduled.	Laeven and Valencia (2008)

Table A5: Summary Statistics

Variable	Mean	Standard Deviation	Minimum	Maximum
Female Labor Force Participation	53.35	17.33	16.94	90.68
Female Unemployment Rate	10.17	7.49	0.50	62.00
Financial crises	0.27	0.44	0.00	1.00
Capital stock per worker	43.43	46.57	0.14	176.92
Foreign direct Investment	1.80	3.93	-2.76	92.67
Openness	60.67	36.50	6.32	290.85
Inflation	0.12	0.15	-0.11	0.99

Table A6: Correlation matrix between dependent and explanatory variables

	FLFPR	FUNR	Crises	CSW	FDI	Open	INF
Female Labor Force Participation(FLFPR)	1.000						
Female Unemployment Rate (FUNR)	-0.276	1.000					
Financial crises (Crises)	-0.050	-0.020	1.000				
Capital stock per worker (CSW)	0.476	-0.208	-0.122	1.000			
Foreign direct Investment (FDI)	0.082	-0.043	-0.040	0.145	1.000		
Openness(Open)	0.054	0.060	-0.086	0.135	0.373	1.000	
Inflation (INF)	-0.274	0.018	0.183	-0.370	-0.119	-0.147	1.000

Table A7 : Impact of Crisis on Female Unemployment Rate in High Income OECD Countries

Dependent variable: Female Unemployment Rate

Variables		Model 1	Model 2	Model 3	Model 4	Model 5
Financial Crisis	Coefficient	0.506	0.768**	0.39	0.341	0.617*
	Robust SE	0.359	0.335	0.353	0.366	0.339
Capital stock per worker	Coefficient	-0.016*	-0.060***	-0.005	-0.009	-0.047***
	Robust SE	0.008	0.01	0.009	0.009	0.01
Inflation	Coefficient		-33.354***			-31.439***
	Robust SE		4.227			4.223
Foreign direct Investment	Coefficient			-0.097***		-0.075***
	Robust SE			0.023		0.023
Openness	Coefficient				-0.033**	-0.007
	Robust SE				0.016	0.016
Constant	Coefficient	10.586***	16.725***	9.585***	11.983***	15.915***
	Robust SE	1.539	1.653	1.545	1.701	1.825
No of observations		386	386	385	386	385
Number of Groups		20	20	20	20	20

R-Square		0.014	0.164	0.061	0.028	0.192
Wald-chi2		5.199*	68.305***	23.167***	9.546**	82.326***

Source: Authors Calculations

Note: * Significant at 10%, ** significant at 5 %, *** significant at 1 %

Table A8 : Impact of Crisis on Female Unemployment Rate in Non-OECD Countries

Dependent variable: Female Unemployment Rate

Variables		Model 1	Model 2	Model 3	Model 4	Model 5
Financial Crisis	Coefficient	0.235	0.462	0.329	0.265	0.643
	Robust SE	0.5	0.502	0.524	0.517	0.54
Capital stock per worker	Coefficient	-0.022	-0.029	-0.028	-0.021	-0.084**
	Robust SE	0.021	0.022	0.027	0.031	0.043
Inflation	Coefficient		-5.078***			-6.414***
	Robust SE		1.4			1.533
Foreign direct Investment	Coefficient			-0.103		-0.260**
	Robust SE			0.099		0.116
Openness	Coefficient				-0.009	0.009
	Robust SE				0.014	0.016
Constant	Coefficient	11.203***	12.062***	11.623***	11.897***	13.473***
	Robust SE	1.361	1.399	1.415	1.557	1.712
No of observations		469	464	450	448	427
Number of Groups		40	40	40	39	39
R-Square		0.002	0.033	0.006	0.005	0.061
Wald-chi2		1.387	14.590***	3.593	1.873	22.792***

Source: Authors Calculations

Note: * Significant at 10%, ** significant at 5 %, *** significant at 1 %

Table A.9: Impact of Crisis on Female Unemployment Rate by different Income Groups

Dependent Variable: Unemployment Rate

		HYE	UMYE	LMYE	LYE
Variables					
Financial Crisis	Coefficient	0.618*	0.225	1.31**	4.29*
	Robust SE	0.333	1.12	0.511	2.47
Capital stock per worker	Coefficient	-0.047***	-0.295**	-0.076	1.66***
	Robust SE	0.009	0.094	0.061	0.6
Openness	Coefficient	-.007	-0.006	0.015	-0.124
	Robust SE	0.02	0.028	0.014	0.083
Foreign direct Investment	Coefficient	-.075**	-0.49	-0.267*	3.24
	Robust SE	0.029	0.32	0.138	0.201
Inflation	Coefficient	-31.43***	-12.09***	-3.36	20.82
	Robust SE	5.33	2.15	2.15	17.71
Constant	Coefficient	15.91***	25.67***	12.39***	0.551
	Robust SE	1.922	4.29	1.916	494
No of observations		385	153	216	34
Number of Groups		20	10	18	9
R-Square		0.19	0.16	0.05	0.35
Wald-chi2		62.23***	40.38***	11.01*	16.17***

Table A.10 - Impact of Crisis on Female Unemployment Rate - Sensitivity Analysis					
Dependent Variable: Total Female Unemployment Rate					
Variables		Model 1	Model 2	Model 3	Model 4
Crisis 2	Coefficient	0.622			
	Robust SE	0.417			
Currency Crisis	Coefficient		1.265**		
	Robust SE		0.627		
Debt Crisis	Coefficient			0.339	
	Robust SE			1.351	
Banking Crisis					0.092
					0.7
Capital stock per worker	Coefficient	-0.022**	-0.021**	-0.021*	-0.021**
	Robust SE	0.011	0.011	0.011	0.011
Openness	Coefficient	-0.003	-0.004	-0.003	-0.003
	Robust SE	0.011	0.011	0.011	0.011
Foreign direct Investment	Coefficient	-0.106***	-0.106***	-0.107***	-0.107***
	Robust SE	0.032	0.032	0.032	0.032
Inflation	Coefficient	-6.407***	-6.611***	-6.159***	-6.159***
	Robust SE	1.183	1.19	1.171	1.172
Constant	Coefficient	12.504***	12.558***	12.485***	12.496***
	Robust SE	1.245	1.25	1.259	1.246
No of observations		812	812	812	812
Number of Groups		59	59	59	59
R-Square		0.057	0.06	0.054	0.054
Wald-chi2		45.647***	47.636***	43.445***	43.312***