The Employment and Welfare Impact of the Financial Crisis in Latvia[1]

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Abstract

Simulations show that Latvia experienced a sharp rise in poverty, widening of the poverty gap, and a rise in income inequality as a result of the economic contraction in 2009. Analysis of the distributional impacts of the crisis on households in Latvia was based on household survey data (Latvian EU-SILC 2006 database) and focused on the impact of the growth slowdown through labor markets.[2] Assuming an 18 percent contraction in GDP (affecting mainly trade hotels and restaurants, construction and manufacturing) the poverty head count increased from 14.4 to 20.2.[3] This is a big increase in poverty and growth incidence curves show that the poor were in fact the hardest hit by the economic slowdown. More pointedly, there will be 130,234 more poor people in Latvia than in 2008, taking the total number of poor people to 453,575. The poverty gap, which measures the poverty deficit of the entire population, too will increase from 5.9 to 8.3 percent.[4] Although a number of assumptions are made in the simulations, we find that the results are robust to most of the assumptions except the post-layoff incomes of people, which have a big mitigating impact on household welfare. We also simulate the impact of the components of Latvia's Emergency Social Safety Net and find that it will mitigated the impacts of the crisis for poor. The simulations only measure the direct short-run impacts, and hence they do not take into account the general equilibrium effects.

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[2] The impacts quantified are direct short-run impacts, and hence they do not take into account the general equilibrium effects.

[3] A household is in poverty if its total household income is below LVL 90 per capita, or approximately US$6 per person per day. In Latvia, this threshold is known as the "needy" line.

[4] The poverty gap ratio is the sum of the income gap ratios for the population below the poverty line (z), divided by the total population (n). It can be expressed as follows:

$$PG = \frac{1}{n}\sum_{i=1}^{q}\left[\frac{z - y_i}{z}\right]$$

I. Introduction

What began as a credit crisis in developed countries has led to a severe contraction in global output and trade. This has turned the economic/financial crisis into a crisis in the real economy, with serious impacts on workers and their families. The global economy, according to the World Bank, shrank by about 2.2 percent in 2009, from a 3.2 percent expansion in 2008—the first time the global economy has shrunk since World War II.[5] The World Bank has estimated that 90 million more people will be living in poverty by the end of 2010 than would have been the case without the crisis.[6] Countries in Eastern Europe and Central Asia are the most adversely affected by the crisis and the growth slowdown is likely to shrink GDP by about 4.7 percent in 2009, from a 4.2 percent increase in 2008.

Latvia was one of the hardest hit countries in Eastern Europe. Its GDP contracted by 18 percent in 2009. The objectives of this note are: i) to estimate the distributional impact of the financial crisis on households in Latvia; and ii) to assess the distributional impact of a number of policy reforms undertaken in response to the crisis. It does so using a methodology that assesses the impact of the growth slowdown or policy reform through its impact on the sources of household income. The impacts quantified are direct short-run impacts, and hence they do not take into account the general equilibrium effects.[7]

Measuring real-time impacts of financial crises or economic slowdowns on households is not possible in most countries because of delays in conducting detailed household surveys. As a result, analyzing the welfare impacts of the crisis will have to be made using simulation tools that have been honed by past research. However, even within the genre of welfare simulation tools, there is considerable variation in methodology, data requirements, assumptions, and analyst's time requirements.

A computable general equilibrium (CGE) model and a micro-simulation (MS) model can be combined in a sequential approach in order assess the effects of various macroeconomic policies and shocks on households. For example, Agénor et al. (2006), Cockburn (2006), Cogneau and Robilliard (2006) Bourguignon and Savard (2008) investigate the distributional impacts of

[5] World Bank (2010)
[6] World Bank (2010)
[7] For example, relative price changes due to changes in domestic demand are not taken into account.

macro-economic structural changes. CGE models have also been combined with micro-simulation models to investigate the impact of macro-economic shocks on households across an income distribution. For example, Robilliard, Bourguignon, and Robinson (2002) apply a CGE model based on a Social Accounting Matrix with 38 sectors and 15 factors of production to quantify the poverty and inequality impacts of the 1997 financial crisis in Indonesia. Although CGE models have the advantage of taking into account not only immediate or direct effects, but also the knock-on effects, they suffer from substantial data requirements. Constructing Social Accounting Matrices (SAM) in countries that do not have them require considerable time and hence, are unsuitable when a quick turnaround is required.

Given the data and time requirements of the combined CGE micro-simulation approach, welfare impacts of the crisis tend to be estimated using the output elasticity of poverty method, and the PovStat software. The former uses the historical trends of output and poverty to determine the relationship between poverty rates and growth in output. Once the relationship is estimated, macroeconomic projections of output can be used to simulate poverty rates. This method is easy to implement and as a result is often used for regional or global poverty simulations. For example, Chen and Ravallion (2008), and Tiongson, et. al (2009) use this technique for global and Eastern Europe and Central Asian poverty simulations respectively. The main drawbacks of the elasticity method are that only aggregate poverty numbers can be estimated and the model requires an estimate of inequality, which is hard to predict based on past information alone because crises vary so much.

The PovStat software has been adopted in a number of settings, including estimating the poverty impacts of the Asian Crisis in 1997-98 and of the recent economic slowdown in Armenia (World Bank, 2009a) and Bulgaria (World Bank, 2009b). The main shortcomings of PovStat are fourfold. First, it has limited capacity to disaggregate within sectors (it allows for three sectors-agriculture, industry and services), however; it has been observed that during the crisis some sectors within these three broad classifications are hit harder than others. For example, trade, hotels and construction were the hardest hit in Latvia. Second, it is good for aggregate poverty/inequality indices, but not for diaggregated distributional impacts. Third, it does not distinguish between formal and informal employment, a crucial distinction in Turkey. Fourth, it is not flexible enough for policy simulations.

The organization of the note is as follows. Section II describes the data used in the note. Section III then summarizes the aggregate impacts of the financial crisis. Next we outline the methodology adopted in the note to measure the distributional impacts of the crisis. Section V presents some results. Finally, Section VII concludes.

II. Data

The main data source for this effort will be the Latvian EU-SILC 2006 database. The survey is an annual survey with a four-year rotational panel.[8] In 2006, the fieldwork started in March and lasted till November. During this period, 4,315 households (9,391 individuals aged 16 and over) were interviewed. Sampled households also contained 1,594 children less than 16 years of age. The reference population is all private households and their current members residing in the national territory. The survey contains modules of income, labor market activity, demographics, education, health, housing, social programs, access to some durable consumption goods and subjective welfare.

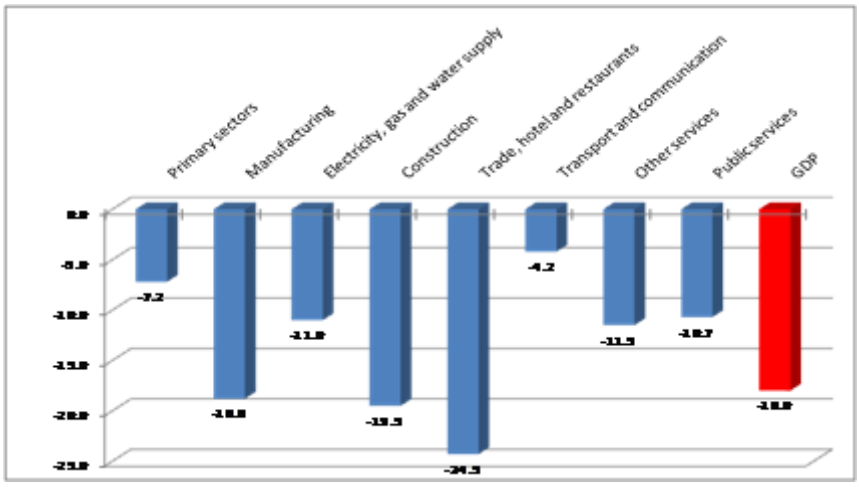
III. Aggregate Impact of the Financial Crisis

Latvia's GDP is forecasted to contract by 18 percent in 2009 relative to 2008.[9] The Ministry of Economics in Latvia has forecast the sectoral breakdown of the GDP contraction (Figure 1). The three hardest hit sectors are trade, hotels and restaurants (expected to contract by 24 percent), construction (19.5 percent) and manufacturing (18.8 percent). The forecasts suggest that the least affected sectors are likely to be transport and communication and the primary sectors, which are expected to decline by 4.2 and 7.2 percent respectively.

Figure 1: Projected contraction in sectoral GDP in 2009 relative to 2008 (percent)

[8] The Latvian EU-SILC survey uses a stratified two-stage sampling design. In the first stage, systematic sampling of the primary sampling units was selected. In the second stage, simple random sampling was used to select secondary sampling units. The survey was stratified by the degree of urbanization.

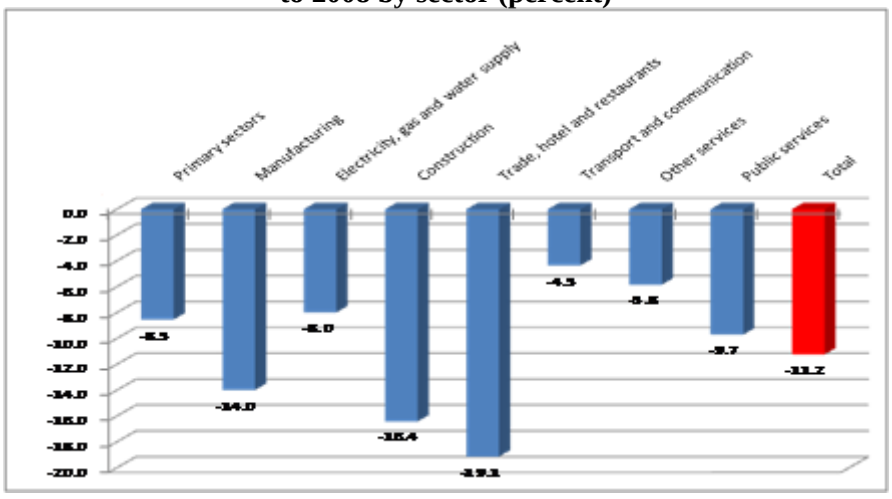
[9] Ministry of Economics, Government of Latvia.



Source: Weighted averages computed by authors based on data from the Ministry of Economics, Government of Latvia.

Also based on Ministry of Economics projections, Figure 2 presents the projected employment contraction in different sectors. More than 126,000 (11.2 percent) jobs are expected to be lost in 2009. The Trade, hotels and restaurants sector and the construction sector are expected to shed a total of 60,000 jobs. The manufacturing sector too is likely to shed almost 14 percent of its jobs in 2009, which is about 24,000 workers.

Figure 2: Projected contraction in employment in 2009 relative to 2008 by sector (percent)



Source: Ministry of Economics, Government of Latvia.

IV. Methodology

The macroeconomic impacts of the financial crisis are transmitted to households through (a) financial markets (via reduced access to credit, eroding savings and asset values); (b) labor markets (via reduced employment, wages and remittances); (c) product markets (via lower growth and production, relative prices changes); and (d) government (and non-governmental) services (e.g. public and private education, health and social protection services).

For Latvia, the dominant impact of the crisis in the short run is likely to come from labor markets through reductions in wages and employment. To measure the distributional impact of the financial crisis, aggregate shocks to employment and GDP have to be linked to individual households. This can be done by combining aggregate information with household survey data.

Our base simulation assumes that workers are either employed in the formal sector or in the informal (grey) sector. The formal sector is expected to reduce both the size of the workforce and wage rates, while the informal sector is expected to only reduce wage rates.[10] We use the projected employment reductions in our simulations, while the amount of the wage reductions is computed such that the total sector GDP growth rates are as predicted above. An implicit assumption is that the growth rate in wages corresponds exactly to growth rates in GDP.

There is a large literature on the characteristics of workers who are most likely to be laid off when a sector contracts. In this note, we consider four lay off models. First, we estimate the determinants of employment based on a host of worker specific observable characteristics such as gender, education level, age (a proxy for experience), location of residence, etc. For each worker, we then compute a propensity score, meaning the likelihood of a worker possessing those observable characteristics to be employed. Then the model assumes that the people to be laid off first are those workers with the least probability of being employed. The second and third models of layoffs are based on the age of the worker. In one case, older workers are laid off and in the other younger workers are laid off.[11] The fourth model assumes that the least educated workers in the sector are the first to be laid off. Finally, we assume that workers are randomly laid off, that is the workers observable characteristics do not predict the layoff patterns.

[10] Alternate scenarios are also tested. For example, in one scenario the formal sector only lays off workers, and the informal sector reduces wages. In another scenario, the we do not make a distinction between formal and informal sectors and hence, all workers can experience layoffs or wage reductions.

[11] Firms might choose to layoff older workers because those workers command high wages for a given set of other productive characteristics, while firms may choose to lay off younger workers because there may be fewer regulatory hurdles to laying off younger workers and because severance payments are lower for younger workers.

We assume that all workers who lose their jobs receive an income equal to about 28.3 percent of their pre-crisis wage, which is the average share of unemployment benefits. We do this because households that lose a significant source of income cope by tapping other sources of income, such as unemployment benefits, remittances, a part-time job, etc. Since, we cannot ex-ante predict what a particular household will do to cope with the reduction in a source of income, we assume that post-layoff income will equal total unemployment benefits.

We further assume that households whose main source of income is from the informal sector experience a welfare decline in line with the decline in per capita GDP. However, the welfare decline of all other households, i.e. those without a worker in either the formal or informal sector, is determined endogenously such that the cumulative welfare decline is the same as the overall GDP contraction for the economy.

The objective of the microsimulations is to estimate the Latvian income distribution under different scenarios. The work follows the spirit of Oxaca (1973), Juhn, Murphy and Pierce (1993) and, more recently, Bourguignon, Ferreira and Lustig (eds.) (2004). Formally, defining the Latvian income distribution at year *t* as D_t:

$$D_t = \{y_{1t}, y_{2t}, ..., y_{Nt}) \qquad (1)$$

Where y_{ht} stands for the household per-capita income of household *h.* The total income of the household comes from the sum of the labor income (Y^L) and non-labor income (Y^{NL}) of all the members of the household:

$$Y_{ht} = \sum_{\forall j \in h} (Y_{jt}^{L} + Y_{jt}^{NL}) \qquad (2)$$

On the one hand, labor income equals the hourly wage earned by the individual (*wi*), times the number of hours worked (Li):

$$Y_{it}^{L} = w_{it}.L_{it} \qquad (3)$$

On the other hand, we can assume that non-labor income equals the sum of an exogenous component ($\overline{Y}^{NL}$) and the unemployment benefit (UB), where

$$UB_{it}(\lambda, w_{it-1}) = \lambda.w_{it-1} \quad \text{and} \qquad 0 \le \lambda \le 1 \qquad (4)$$

A typical microsimulation exercise assesses the change in the income distribution that arises from a change in a parameter (or in a set of parameters*)* that affects the previous sources of income.

For instance, we can simulate the change in the Latvian income distribution that would arise if the unemployment benefit is increased to λ'%, and the remaining variables are not modified:

$$D_{t'}(\lambda') = \{y_{1t'}(\lambda'), y_{2t'}(\lambda'),..., y_{Nt'}(\lambda')\} \qquad (5)$$

The objective of the exercise is to compare the distributions (1) and (6) in terms of some distributive index I (measuring poverty or inequality), for instance:

$$I(D_{t'}(\lambda')) - I(D_t) \qquad (6)$$

In particular, for those formal workers employed in sector *s* we assume in our benchmark exercise that:

$$Y_{it}^L(\text{s}) = 0 \text{ if } \phi(X\beta) < threshold(s) \text{ and } formal = 1 \quad (7)$$

Where $\phi(X\beta)$ is the likelihood of being employed. Therefore, if the likelihood of being employed is under a certain threshold, we simulate that the individual will be laid off and, therefore, his labor income will be zero. This threshold is endogenously adjusted to replicate the unemployment projections for sector *s* in our microdata. Their total income would never be zero since $\lambda = 28\%$.

On the other hand, we assume that the labor income of informal workers will be given by:

$$Y_{it}^L(s) = (1-\alpha^I(s))(w_{it}.L_{it}) \text{ if } formal = 0 \qquad (8)$$

Where $\alpha^I(s)$ is the GDP contraction projected for sector *s.* In addition, the labor income of formal workers that keep their jobs would be endogenously adjusted (through $\alpha^F(s)$) to be consistent with the GDP projections of sector *s*

$$Y_{it}^L(s) = \alpha^F(s)(w_{it}.L_{it}) \text{ if } \phi(X\beta) > threshold(s) \text{ and } formal = 1 \qquad (9)$$

V. Results

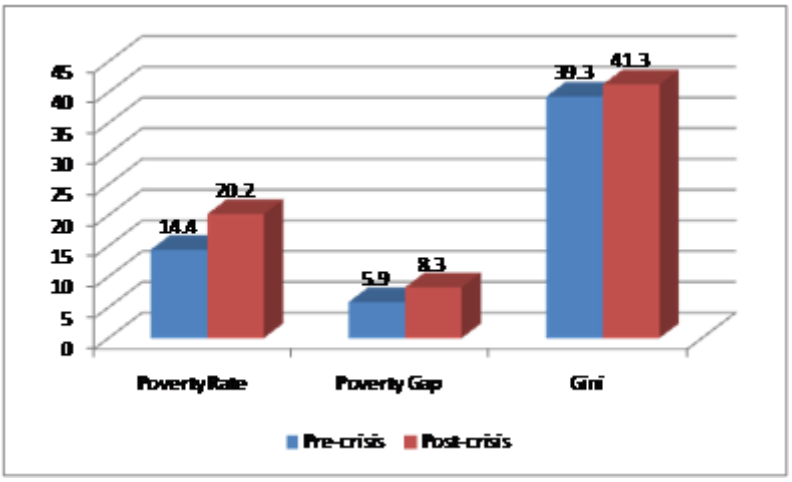
V.I Results: Simulated impact on poverty and inequality

Applying the methodology described above with the aggregate projections and the assumptions of the model, a number of interesting results are observed.

Simulations show that Latvia will experience a sharp rise in poverty, widening of the poverty gap, and a rise in income inequality (

Figure 3). With an 18 percent GDP contraction in 2009 and the above employment projections, the percentage of people in poverty will increase from 14.4 to 20.2.[12] In other words, there will be 130,234 more poor people in Latvia than in 2008, taking the total number of poor people to 453,575. The poverty gap, which measures the poverty deficit of the entire population, too will increase from 5.9 to 8,3 percent.[13] Finally, income inequality too will increase as a result of the crisis, with the Gini coefficient increasing from 39.3 to 41.3 percent. It should be noted that these simulations assume that no countervailing measures are implemented by the government to specifically address the impact on poverty.

Figure 3: Simulated impact of the crisis on the poverty head count, the poverty gap and income inequality



Source: Authors calculations using 2006 EU-SILC.

There are substantial differences in the impact of the contraction across regions and specific population groups (
Figure 5). The largest increase in poverty is observed in the poor region of Latgale where the majority of employed people are likely to have been working in precarious, low wage jobs even prior to the crisis. In this region, which is also home to a large population of ethnic Russians, a large number of full time workers receive a wage at or near the poverty line, which implies that

[12] A household is in poverty if its total household income is below LVL 90 per capita per month, or approximately US$6 per person per day. There is no official poverty line in Latvia, but the LVL 90 per capita per month is known as the "needy" line.

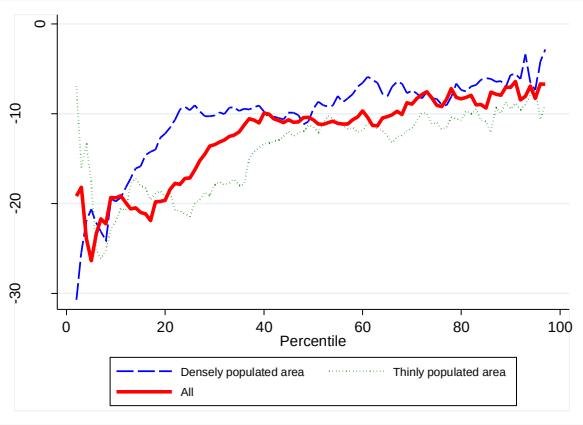
[13] The poverty gap ratio is the sum of the income gap ratios for the population below the poverty line (z), divided by the total population (n). It can be expressed as follows:

$$PG = \frac{1}{n}\sum_{i=1}^{q}\left[\frac{z - y_i}{z}\right]$$

the impact of the crisis, whether it trickles down to households though the loss of employment or the reduction in wages, on poverty has been substantial. The impact of the crisis is also felt more sharply in households where a man is the primary income earner, which to a large extent is explained by the contraction in the mostly-male-employing construction sector. Households in which economically active members have few skills (education levels of high school or less) suffer relatively more. Finally, households with children also suffer a greater impact.

To analyze where in the distribution people are affected most by the economic contraction, we plot Growth Incidence Curves. These are cures that comparing across two time periods, t−1 and t, the growth rate in income of the p^{th} quantile as gt(p)=[yt(p)/yt−1(p)]−1. Varying p vary from 0 to 1, gt(p) traces growth incidence curve (GIC). Figure 4 plots for GIC for Latvia as a whole and also disaggregates the GIC by densely and thinly populated areas. For all of Latvia, households with per capita income in the bottom 40 percent of the income distribution were the hardest hit by the economic slowdown. This is also true for the densely populated areas, which include the major cities. However, although people in the bottom 40 percent of the income distribution were hit harder by the crisis, the very poor households in rural areas were spared a little by the crisis. In other words, in rural areas, it was more likely that people above the 5^{th} percentile and below the 40^{th} percentile were the hardest hit by the economic slowdown. Habib, et al. (2010) report that the poor were the hardest hit in the Philippines and Mexico, while it was richer households, especially in rural areas, that were hit in Bangladesh.

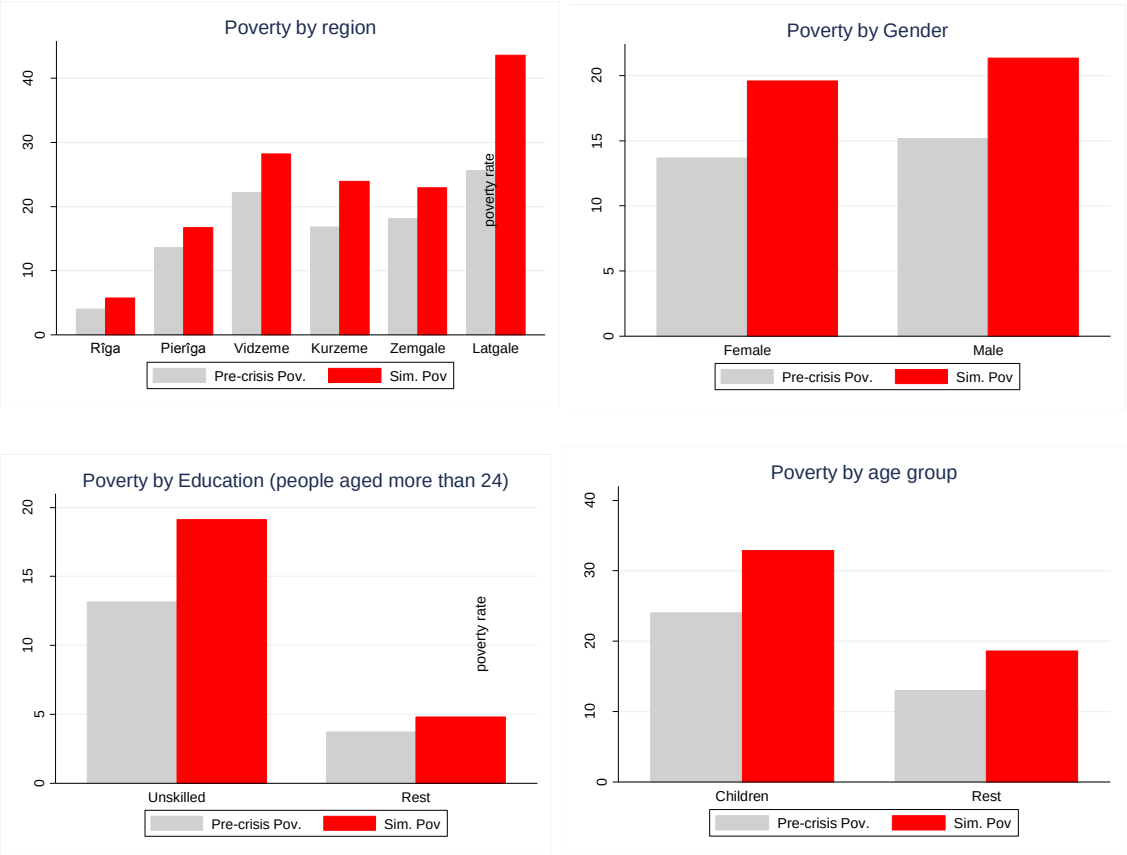
Figure 4: Growth Incidence curve for Latvia: Percentage increase in per capita household income between 2008 and 2009



Source: Authors calculations based on 2006 EU-SILC.

The impact of the crisis is also felt more sharply in households were a man is the primary income earner, which is explained by the very large male presence in the hard-hit construction sector. In addition, households in which economically active members have few skills (high school completion or less) suffer larger losses in household welfare relative to households with more skills. Finally, households with children suffer greater impact than those without children.

Figure 5: The impact of the crisis by region, gender, education and age group



Source: Authors calculations based on 2006 EU-SILC.

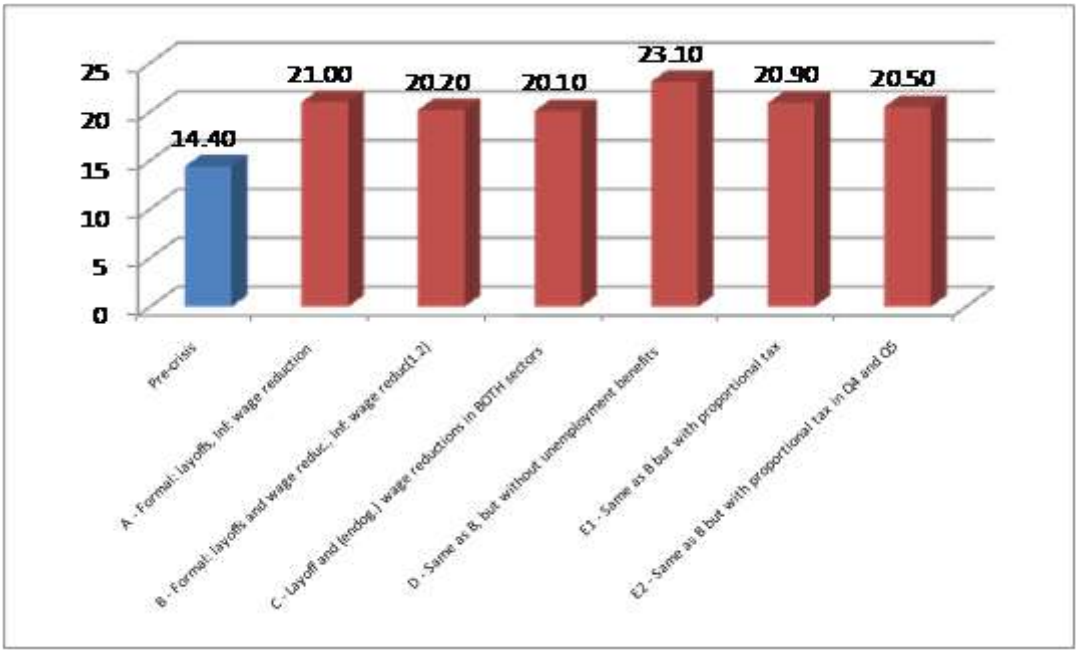
V.II Results: Sensitivity Analysis of poverty and inequality impact

Among the modifications in the assumptions tested for robustness are A) allowing layoffs in the formal sector but no wage reductions, and only allowing wage reductions in the informal sector and no layoffs; B) allowing formal sector layoffs and wage reductions but only wage reductions in the informal sector; C) allowing layoffs in both the informal and formal sector and endogenously determining the wage reduction; D) same as B but with no unemployment benefits paid out; E1) same as B but with a proportional tax to pay for the increased unemployment

benefits; and E2) same as B but with a proportional tax on households in quintile 4 and 5 to pay for the increased unemployment benefits. Based on discussions with various stakeholders in Latvia, model B is chosen as the preferred model.

The conclusion of the sensitivity tests is that the increase in poverty from 14.4 to 20.2 is very robust to different conditions (Figure 6). However, there is one exception to the robustness finding. If post layoff incomes are not comparable the unemployment benefit amount that a worker would be eligible to receive, the impact on poverty can be as high as 23 percent.

Figure 6: Sensitivity analysis of poverty simulations for various assumptions



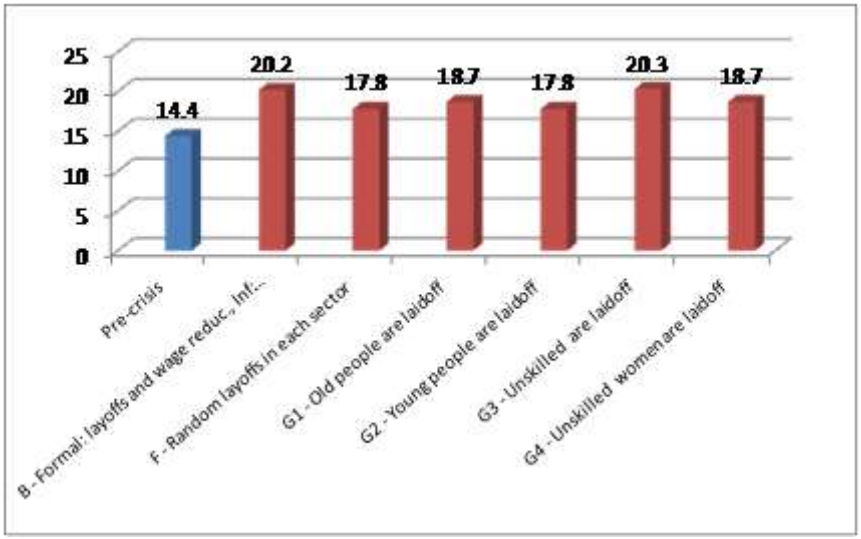
Source: Authors calculations based on 2006 EU-SILC.

A further test of sensitivity is conducted for different patterns of layoffs (Figure 7). The layoff models considered included the following: i) layoffs are by propensity scores of employment; ii) laying off people in the sector randomly; iii) laying off older workers in the sector; iv) laying off younger workers; v) laying off unskilled workers; and v) laying off unskilled women.

The simulated poverty rates however are dependent on the layoff model chosen. It appears however, that randomly laying off people will lead to a lower simulated poverty head count than under most of the other models. Unsurprisingly, laying off unskilled workers over the skilled workers will lead to the largest increase in poverty relative to other layoff models. Consultations

with Government of Latvia officials and others suggest that using layoff based on the probability of employment is likely to be the most useful for Latvia.

Figure 8: Sensitivity under different layoff models



Source: Authors calculations based on 2006 EU-SILC.

V.III Simulated impact of policy response

In response to the crisis, the Government of Latvia initiated several policy responses to mitigate the potential distributive implications of the crisis especially on the poor. We present a few hypothetical tradeoffs between different social safety net scenarios below:

a) Increasing the eligibility threshold at which the Guaranteed Minimum Income (GMI) is provided

To mitigate the impact of the crisis on the poorest population in Lativa, the Government increased the eligibility threshold at which the GMI is provided to households in need. This reform had two impacts. First, it led to higher coverage and second it led to higher transfer to poor households and in doing so, lower the poverty gap. At the end of 2007, the GMI threshold was LVL 28 per person per month. However, at the beginning on 2008, the threshold was increased to LVL 37 per person per month and then in October, 2009 the threshold was increased again to LVL 40. If targeting were perfect, then the increase in the threshold will lead to 21,000 new GMI beneficiaries. Because the GMI eligibility threshold is still below the "needy" poverty line the team has used for these simulations (90 LVL per capita per month, approximately equivalent to

the Leaken measure), there will be no change in the poverty rate. However, with the decrease in the poverty gap there is a reduction in household deprivation.

b) The existing Family State Benefits program is withdrawn and replaced by targeted cash transfer to the poor

Although the Government did not pursue this option, we also simulated the impact of withdrawing the untargeted Family State Benefits (FSB) allowance and using the funds for more targeted transfers. If the FSB are withdrawn, the post-crisis poverty rate will jump from 20.4 percent to 22.8 percent in 2009. If the FSB are replaced by top up cash transfer to the poverty line of 90 LVL per capita per month, the poverty level remains unaffected (because the poverty threshold is 90 LVL per capita per month). However, the poverty gap decreases. We can also project the costs to see how the cost of the program increases. Having this kind of information will help policy makers to streamline the various safety net programs especially during financial stress.

Table 1: Hypothetical tradeoff between Family State Benefits and a targeted cash transfer

	With Family Allowance		**If family allowances Withdrawn**		**If family allowance withdrawn and Replaced by TOP-UP GMI**
	2008	**2009***	**2008**	**2009***	**2009***
Income	**% of population**	**% of population**	**% of population**	**% of population**	**% of population**
less than 50 Lats	5.04	8.23	6.70	10.13	0
>=50 & <75 Lats	5.70	7.87	5.98	8.08	18.21
>=75 & <90 Lats	3.63	4.29	3.43	4.58	4.58
Poverty Rate (<90 Lats)	**14.36**	**20.39**	**16.11**	**22.79**	**22.79**
Poverty GAP	**5.86**	**8.27**	**7.236**	**10.30**	**6.49**

Notes: A household will get (70-percap) lats/ child and (50-percap) lats/adult if its per capita income is less 50 lats
*Projections based on the baseline scenario

Cost Projections

	Estimated Cost in Million

	Lats
Total amount paid as family benefits in 2008	83.40
Total projected amount needed for Top-UP GMI in 2008	65.69
Total projected amount needed for Top-UP GMI after crisis in 2009	92.46

c) Increasing household incomes of unemployed people either through augmented unemployment benefits or the provision of public works

Unemployed people are disproportionately represented among the poor in Latvia. Improving their welfare without affecting incentives to seek regular work is crucial. In this regard, the Government took 2 steps. First, the Government increased the duration during which unemployment benefits are paid to 9 months, where a payment of 45 LVL (a quarter of the minimum wage) is made for either 3 or 6 months depending on whether the unemployed person receives unemployment insurance benefits for 6 or 3 months respectively. Second, the Government began a public works program that pays 100 LVL per month (the minimum wage is 180 LVL per month) to participants. Both of these measures increase the incomes of households.

In the aftermath of the crisis, if no unemployment benefits are paid, poverty rises dramatically to 23.1 percent. Under the 2008 rules of the unemployment insurance plan, the typical newly unemployed person received a benefit of about 28 percent of his/her pre-layoff income. With no changes to the plan, the expected poverty in the wake of the contraction is 20.2 as reported above. However, if that amount of the average post job-loss benefit were to increase to 40 or 50 percent (either through the more generous parameters passed early in 2009, or with the stipend from public works), then aggregate poverty in the wake of the contraction is reduced to 19.1 or 18.1 percent, respectively. Neither of the measures is likely to have a significant impact on incentives to rejoin the formal labor force when the labor market starts to recover, because the unemployment benefit top-up is low and because the public works stipend is lower than the minimum wage.

Table 3: Poverty and cost of unemployment bill in different Unemployment benefit rate scenario

Unemployment Benefit Rate	Poverty Rate	Gini	Unemployment Bill in Millions Lats
Pre-Crisis	**14.4**	**39.33**	
0	23.1	43.19	0
5	22.8	42.84	19.57
10	22.4	42.51	39.13

15	21.7	42.2	58.70
20	21.1	41.9	78.27
25	20.6	41.62	97.83
30	20.3	41.36	117.40
35	19.8	41.11	136.97
40	19.1	40.88	156.53
45	18.7	40.66	176.10
50	18.1	40.46	195.67

VII. Conclusions

Latvia will experience a sharp rise in poverty, widening of the poverty gap, and a rise in inequality as a result of the financial crisis. Using Latvia's "needy line" (LVL 90 per capita per month) as the poverty threshold – roughly equivalent to the Leaken measure of relative poverty, the impact of the labor market adjustment is to raise poverty from 14.4 at the end of 2008 to 20.2 by the end of 2009. In other words, there will be more than 130,000 more poor people in Latvia than in 2008, taking the total number of poor people to more than 453,000. During the same period, the poverty gap increased from 5.9 to 8.3 percent, indicating that poor households are becoming poorer. Income inequality also increases, with the Gini coefficient rising from 39.3 to 41.3.

Much of the social impact of the crisis can be traced through the impact on the labor market. With an 18 percent contraction of GDP in 2009, the sectors most severely affected are trade hotels and restaurants, construction, and manufacturing. This leads to a loss of more than 126,000 formal jobs, or 11.2 percent of the workforce. The large contraction in overall employment reflects employment contractions of 19 percent in trade hotels and restaurants, 16 percent in construction, and 14 percent in manufacturing. Finally, there are substantial differences in the impact of the financial crisis across regions and specific population groups in Latvia.

The Government of Latvia put a number of programs in place to mitigate the impact of the crisis on households. These measures included increasing the threshold rate of the Guaranteed Minimum Income program, which is the main poverty targeted program in Latvia; and implementing a self-targeted public works program for unemployed people. These measures have helped to cushion the impact of the crisis for some of the hardest hit households. However,

the scale of the crisis was too large for programs such as these to offset the negative impacts and hence the pain of the crisis remains considerable.

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Annex

The annex shows step-by-step adjustments and assumptions made in the simulation.

1. Our starting point is 2006 SILC data for Latvia. There are two types of incomes accruing to the households: one at the household level, the other at the individual levels. The individual level incomes within a household are aggregated and added with the household income to get the household total income. Household total income is divided by household size to get per capita expenditure.
2. To bring the 2006 data (latest available SILC data) to 2008 level, we apply the real sectoral (12 sectors) wage growth between 2006 and 2008 to 2006 labor income. Pension income is also inflated by the wage growth in public administration. Rest of the individual or household income is inflated by average wage growth rate between 2006 and 2008.
3. We classify individuals into four category: employed, unemployed, retired, inactive person. Employed persons are further categorized into formal-informal and different sectors.
4. We estimate the probability of being employed of each individual using a probit model.
5. In our base case scenario, we assume that formal sector experience job cuts and wage cuts both, while informal sector experience wage cut which is 20 percent more than the sectoral GDP contraction. We layoff employed individuals from different sectors such that the sector wise layoffs match the sector wise projected employment contractions. Now the wage reduction in formal sector become endogenous as it is determined by sector wise GDP contraction and contraction in informal wage.
6. Once we get the simulated labor income for each individuals, we construct the per capita household income as described in step 1. This gives us crisis per capita income.