

Measuring employment deprivation among households in the EU

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Motivation

- The current great economic depression has brought **massive unemployment** back to Europe, especially Spain, Ireland, Greece and the Baltics.
- Its implications on well-being depend on the **household** dimension,
 - employment of households' members is the main source of regular income and social inclusion for the majority of the population,
 - workless households,
 - unemployment of a member increases economic insecurity for the whole household:
 - more vulnerable to economic shocks,
 - the Mediterranean welfare system: the *family* net.
- Very **limited amount of research** on appropriate measures that do take into account the “household dimension” of employment deprivation.

Aim

- To propose an **aggregate measure** of **employment deprivation among households** that, like other well-being indicators, is increasing in:
 - the **incidence** of household unemployment (how many households are touched by the lack of employment of any of its members),
 - its **intensity** (how far are households on average from being employment non-deprived), and
 - **inequality** of employment exclusion across deprived households (how concentrated is unemployment in a few of them).
- To use this framework to analyze recent unemployment in **the EU**,
 - in order to show the relevance of the households' dimension.

Stages

- **Identification** of the deprived
 - narrow: unemployed (ILO definition),
 - broader: + underemployed (full/part-timers)
- **Aggregation** of individual information into an overall employment deprivation measure.
 - i) Household-level deprivation index
 - ii) Society-level deprivation index
 - In both indices we use **Foster-Greer-Thorbecke's**-type of measures,
 - we incorporate the standard unemployment rate and several workless household rates as particular cases.

Notation

- N “active” households (with at least 1 economically active member)
- Individual employment gap for household i :

general

$$g_{ij}^{\gamma} = \begin{cases} \left(\frac{\bar{h} - h_{ij}}{\bar{h}} \right)^{\gamma} & \text{if } h_{ij} < \bar{h} \text{ and } j \in \Theta_i \\ 0 & \text{otherwise,} \end{cases} \quad \gamma \geq 0$$

ILO unemployment status

$$g_{ij} = \begin{cases} 0 & \text{if employed} \\ 1 & \text{if unemployed} \end{cases}$$

$h_{ij} \geq 0$ number of working hours of individual j ;

$\bar{h} > 0$ individual working hours threshold -i.e. wished, usual, potential-

Θ_i set of underemployed (unemployed) individuals in household i .

Desirable properties for the employment deprivation indicator

Household-level: $u_i(g_{ij}^\gamma)$

- **continuity, scale invariance, anonymity, replication invariance, focus**
- the household dimension is introduced by:
 - **monotonicity:** a decrease in the hours worked by any employment deprived individual should lead to an increase in u_i .
 - **regressive transfer:** a transfer of working time from a deprived individual towards another household member who is less deprived (with a lower gap) would always increase u_i .
- special case: employment gap is a dichotomous 0/1 variable
 - **anonymity, replication invariance** and
 - **increasing proportion of employment deprived individuals:** u_i increasing in the number of deprived individuals within the household.

Society-level: $U(u_1, \dots, u_N)$

- **continuity, anonymity, replication invariance, monotonicity**

It must reflect society's preference about the distribution of household employment

- **preference for unemployment equality among deprived households:**

U decreases whenever there is an equalization of u_i s.

- The **official unemployment rate** can be understood as an index that aggregates unemployment first within the household and then among the population.
 - In both cases, this is done by calculating the mean.

$$u_i(g_i) = \frac{1}{H_i^A} \sum_{j=1}^{H_i^A} g_{ij} \quad \text{if } j \in \Theta_i^u$$

H_i^A = number of economically active individuals in household i .

$$U(\mathbf{u}) = \sum_{i=1}^N u_i \frac{H_i^A}{\sum_{i=1}^N H_i^A}$$

- It satisfies the 3 axioms we required for the household employment deprivation index (in the case of 0/1 gaps).
- It satisfies all the axioms for the aggregate index, except that related to the **preference for unemployment equality** among deprived households.

The aggregate household employment deprivation measure

- household employment deprivation indicator:

$$u_i(g_i^\gamma; \tau) = \begin{cases} \frac{1}{H_i^A} \sum_{j=1}^{H_i^A} g_{ij}^\gamma & \text{if } \hat{u}_i \geq \tau \\ 0 & \text{if } \hat{u}_i < \tau \end{cases} \quad \hat{u}_i = \frac{1}{H_i^A} \sum_{j=1}^{H_i^A} g_{ij}^1 \cdot \quad 0 \leq \tau \leq 1$$

- aggregate household employment:

$$U(u) = \begin{cases} \sum_{i=1}^N u_i^\alpha \omega_i = \sum_{i=1}^N \left[\frac{1}{H_i^A} \sum_{j=1}^{H_i^A} g_{ij}^\gamma \right]^\alpha \omega_i & \text{if } \alpha > 0 \\ \sum_{i=1}^N I(u_i) \omega_i & \text{if } \alpha = 0, \end{cases} \quad \begin{matrix} \omega_i \text{ weigh associated} \\ \text{to household } i. \\ I(u_i) = \begin{cases} 1 & \text{if } u_i > 0 \\ 0 & \text{if } u_i = 0, \end{cases} \end{matrix}$$

- it inherits FGT properties, in particular, it is decomposable into incidence, intensity and inequality

– i.e. $\alpha = 2$ $U(u) = H \left[I^2 + (1-I)^2 C_{1-u}^2 \right] = H \left[I^2 + V_u \right]$

Employment deprivation in the EU

- Sample of individuals living in households with, at least, one economically active member (15-74 years old).
- EU Labour Force Survey (EUROSTAT)
 - 2007-2009 period,
 - 23 countries (Malta and the Nordics excluded),
 - ILO Unemployment status reported at the 2nd Quarter of each year,
 - underemployed: work less than the usual weekly hours of full-timers (mode) in their country, while willing to work more.

Figure 1. Aggregate household employment deprivation index for EU countries in 2009

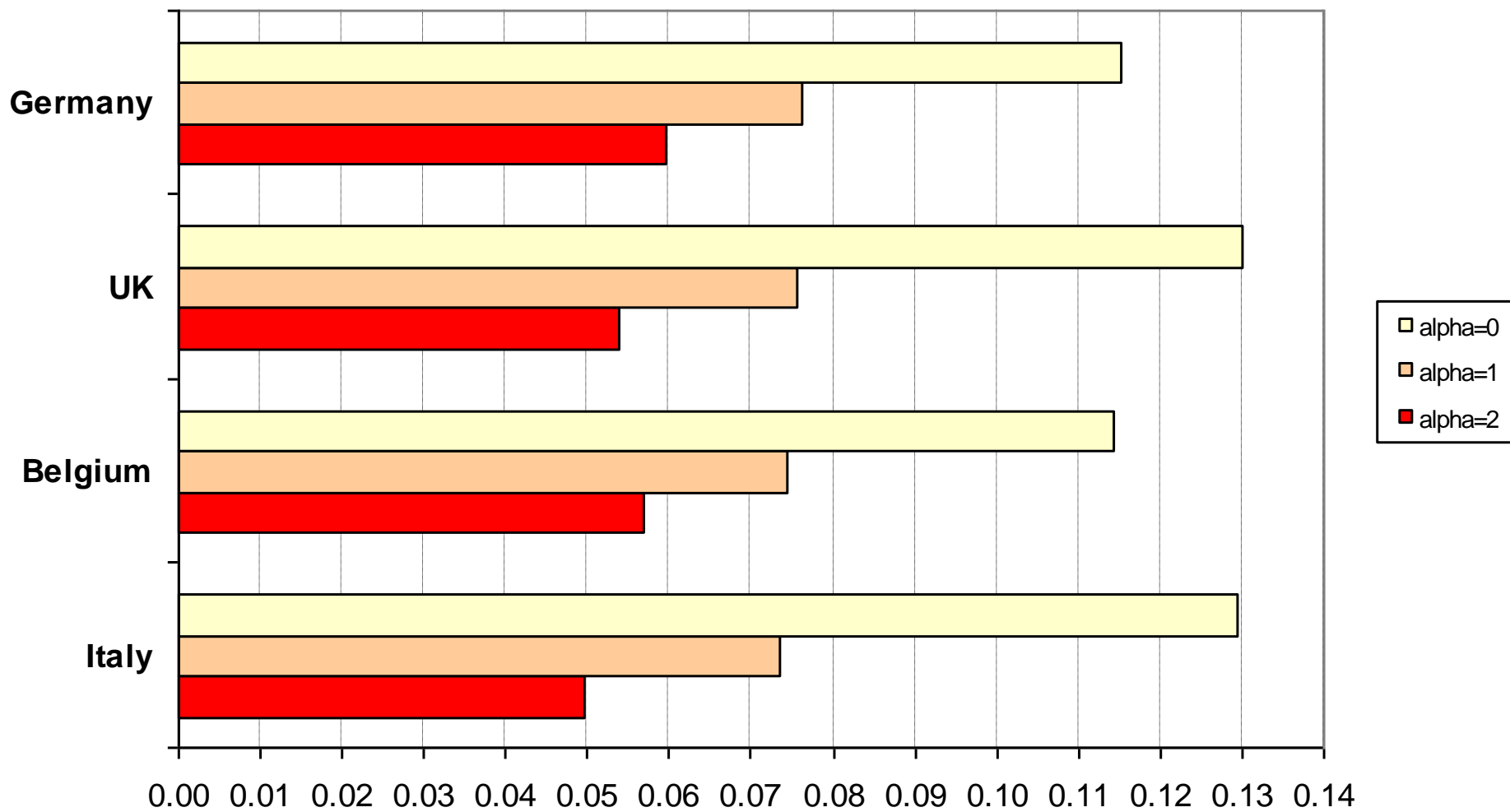
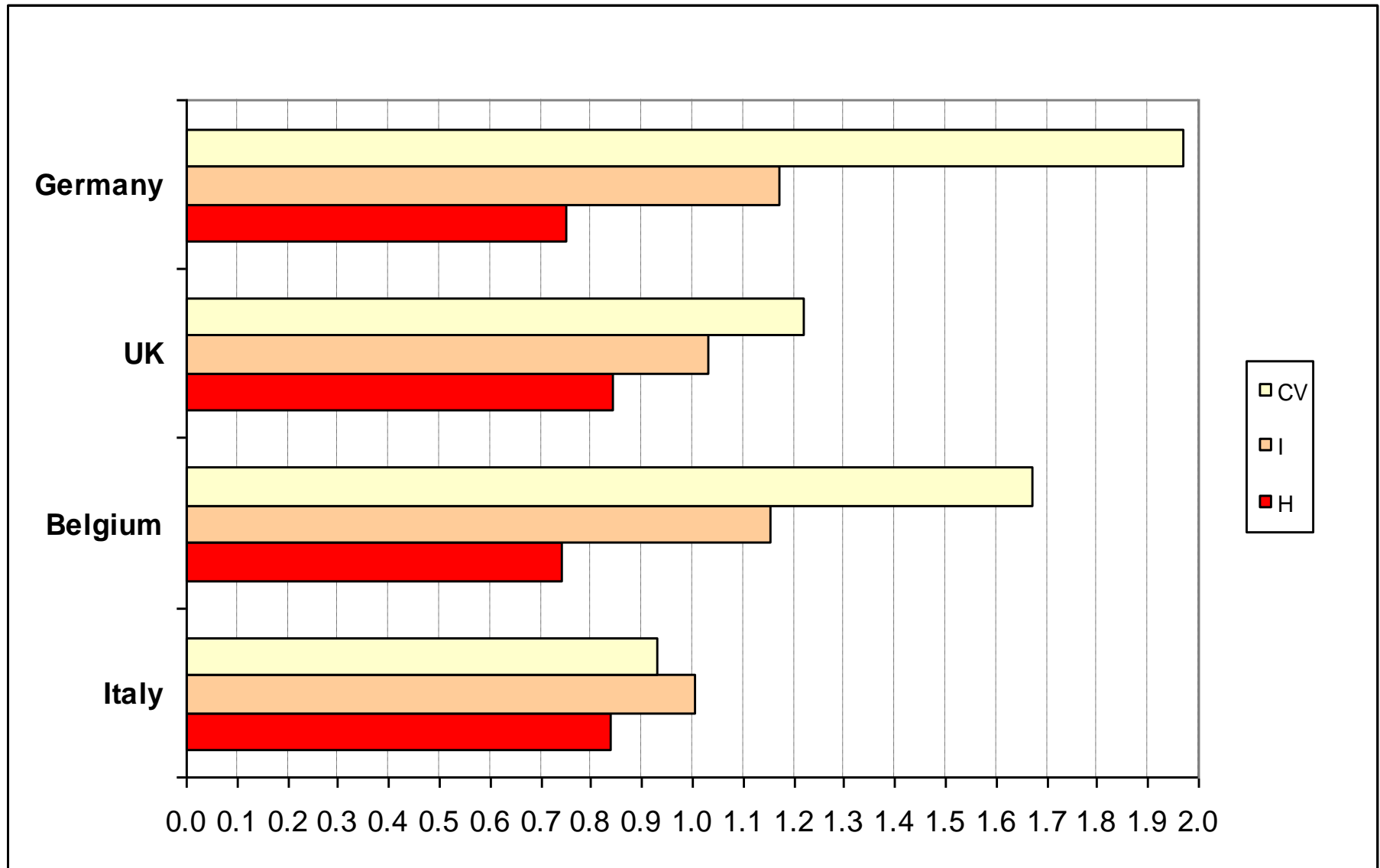


Figure 3. Decomposing the aggregate household employment deprivation index (alpha=2) for EU countries in 2009 relative to the unweighted average



Distribution of household employment deprivation

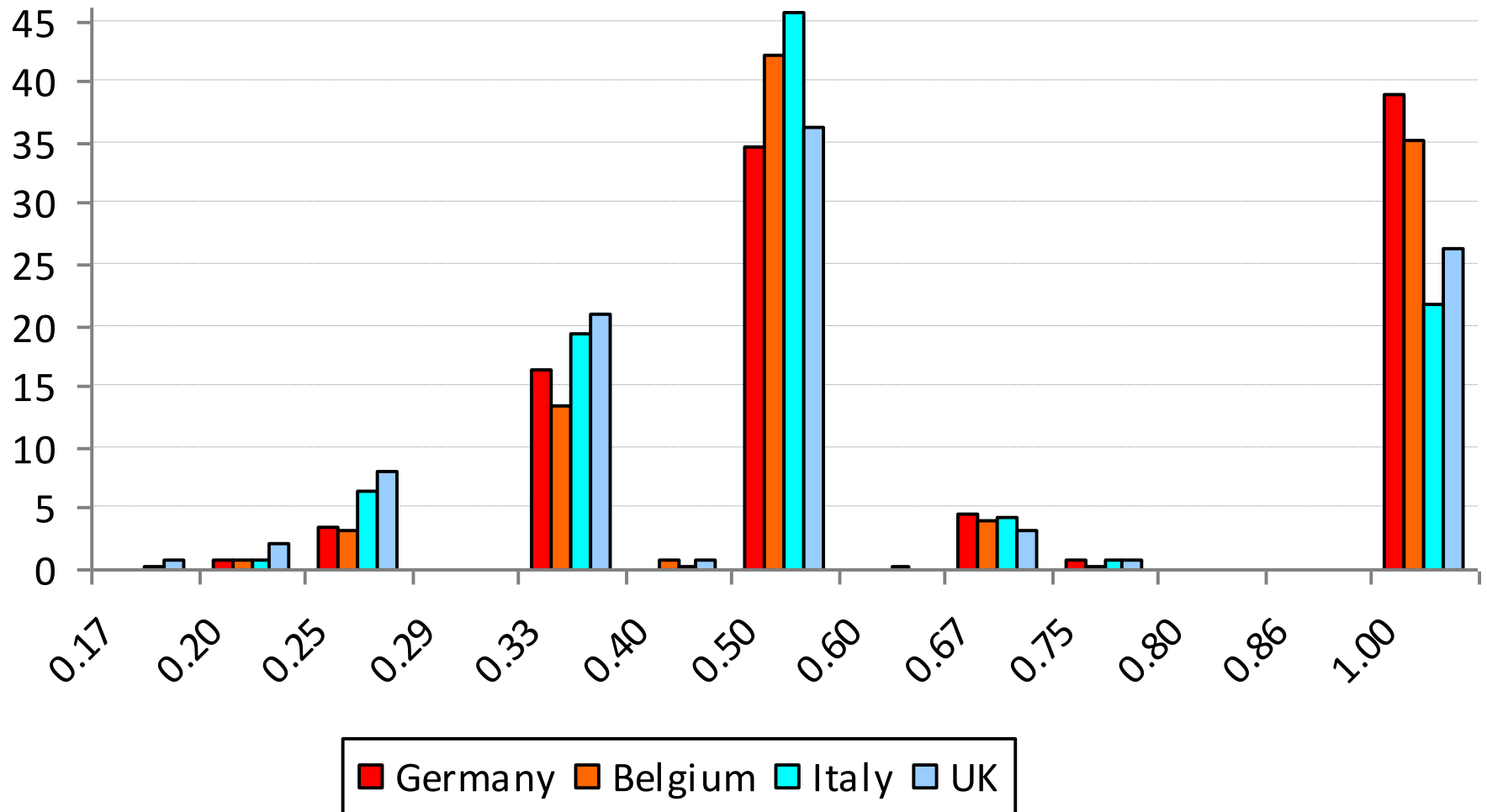


Figure 5. Percentage of variation of the aggregate household employment deprivation index for EU countries: 2007-2009

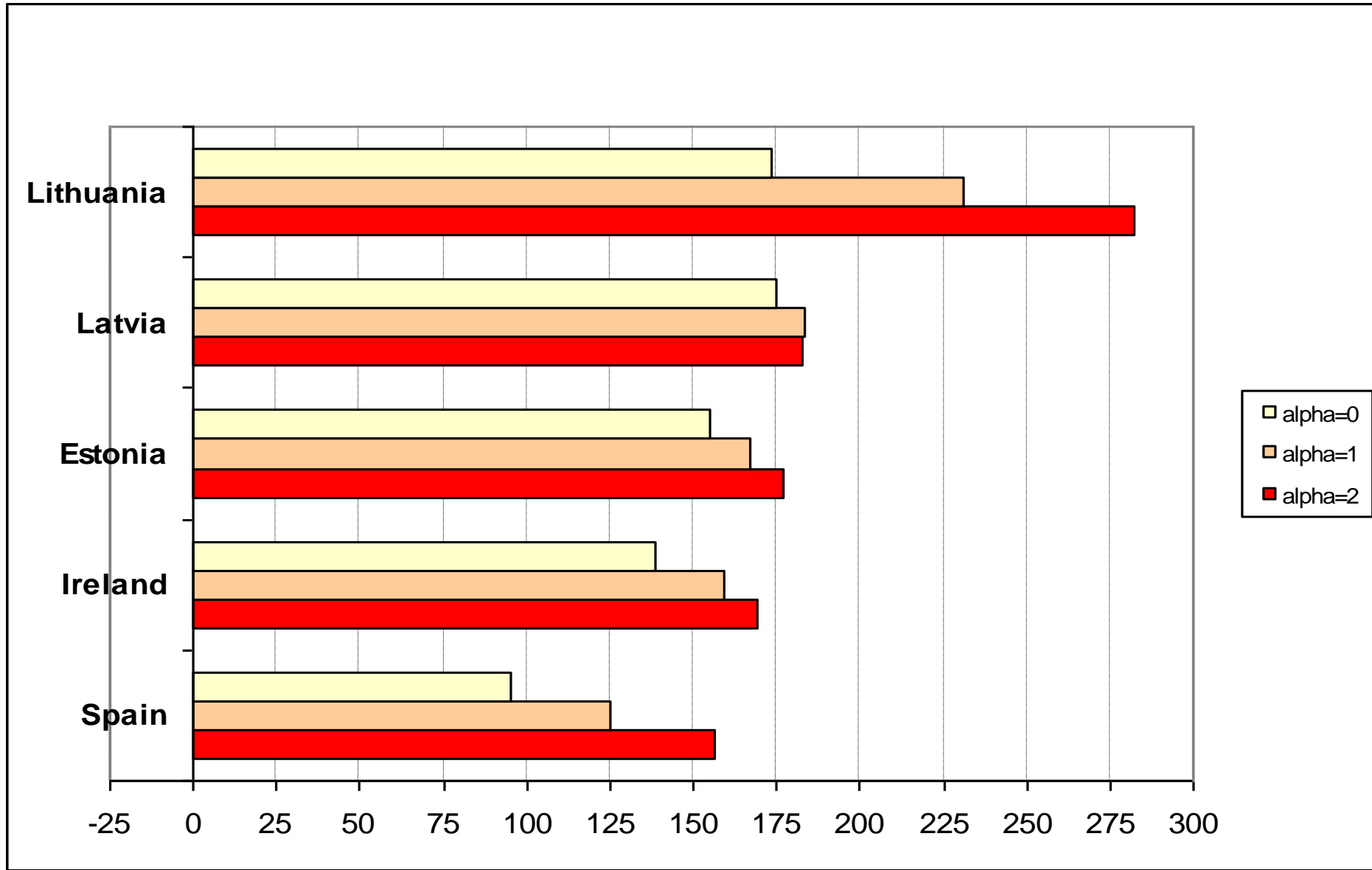


Figure 6. Percentage of variation in incidence, intensity and inequality of employment deprivation index for EU countries: 2007-2009

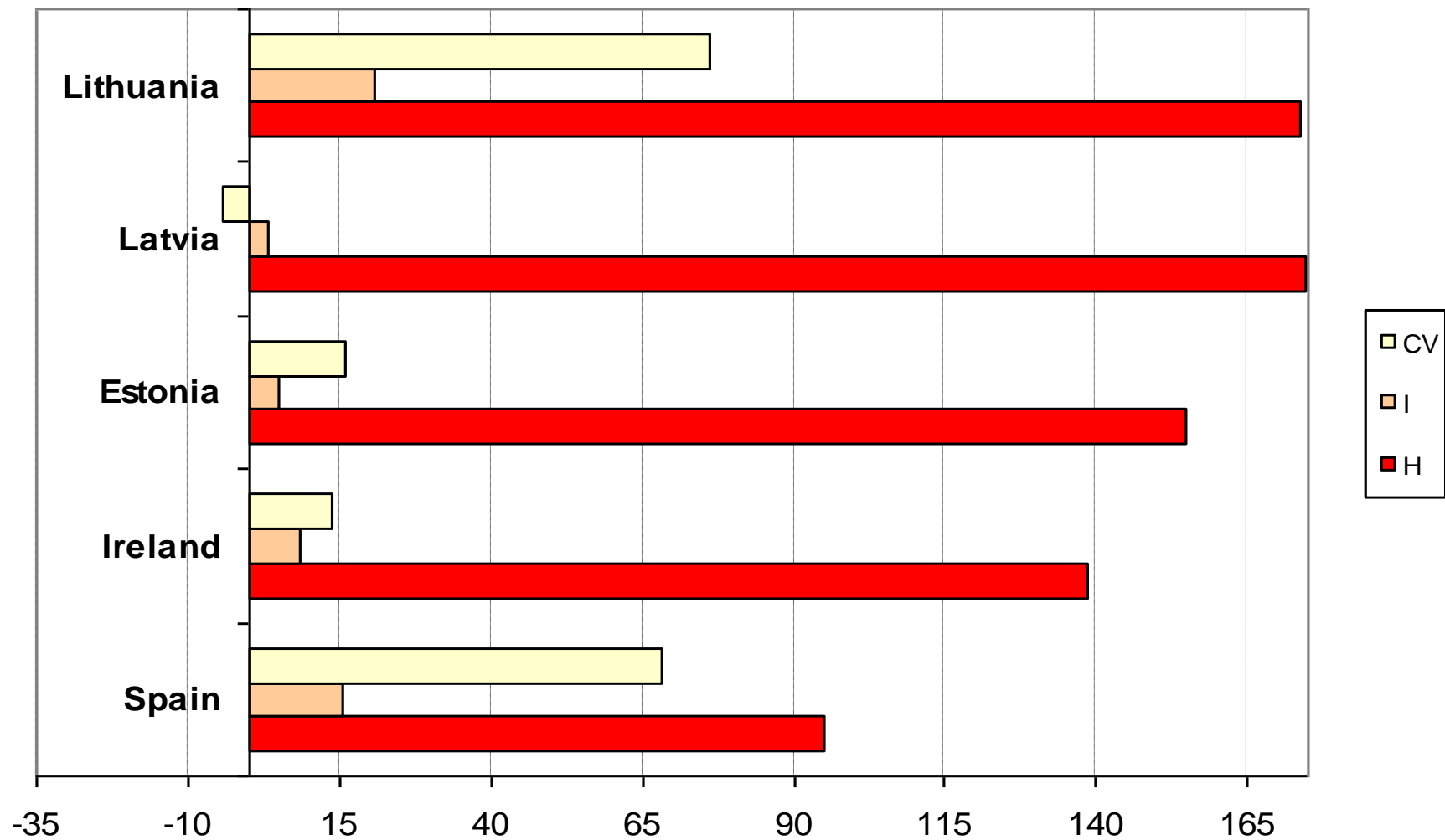


Figure 8. Change in the incidence, intensity and inequality components of aggregate household employment deprivation (with underemployment), 2009

$$\gamma = 1 \quad \alpha = 2$$

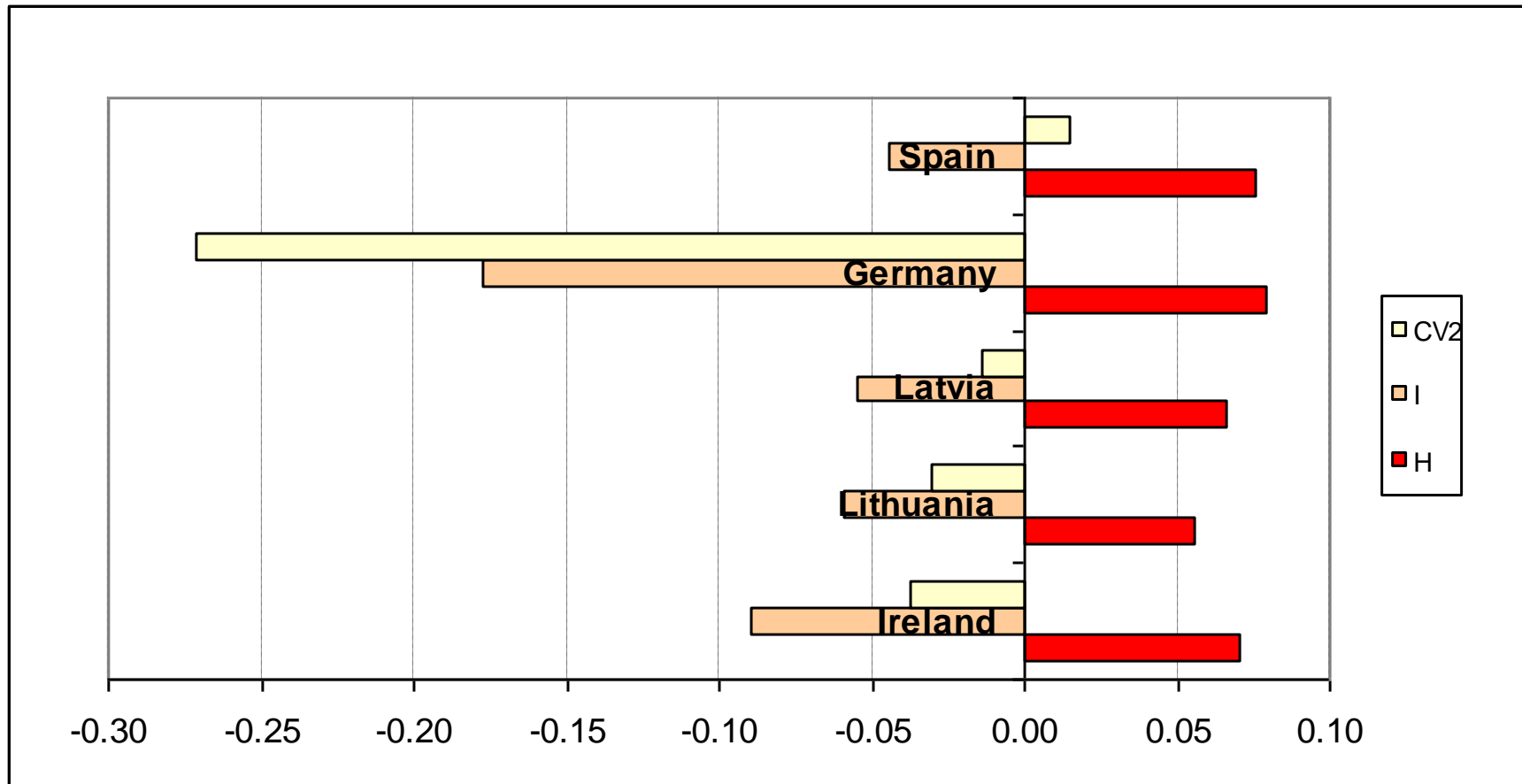
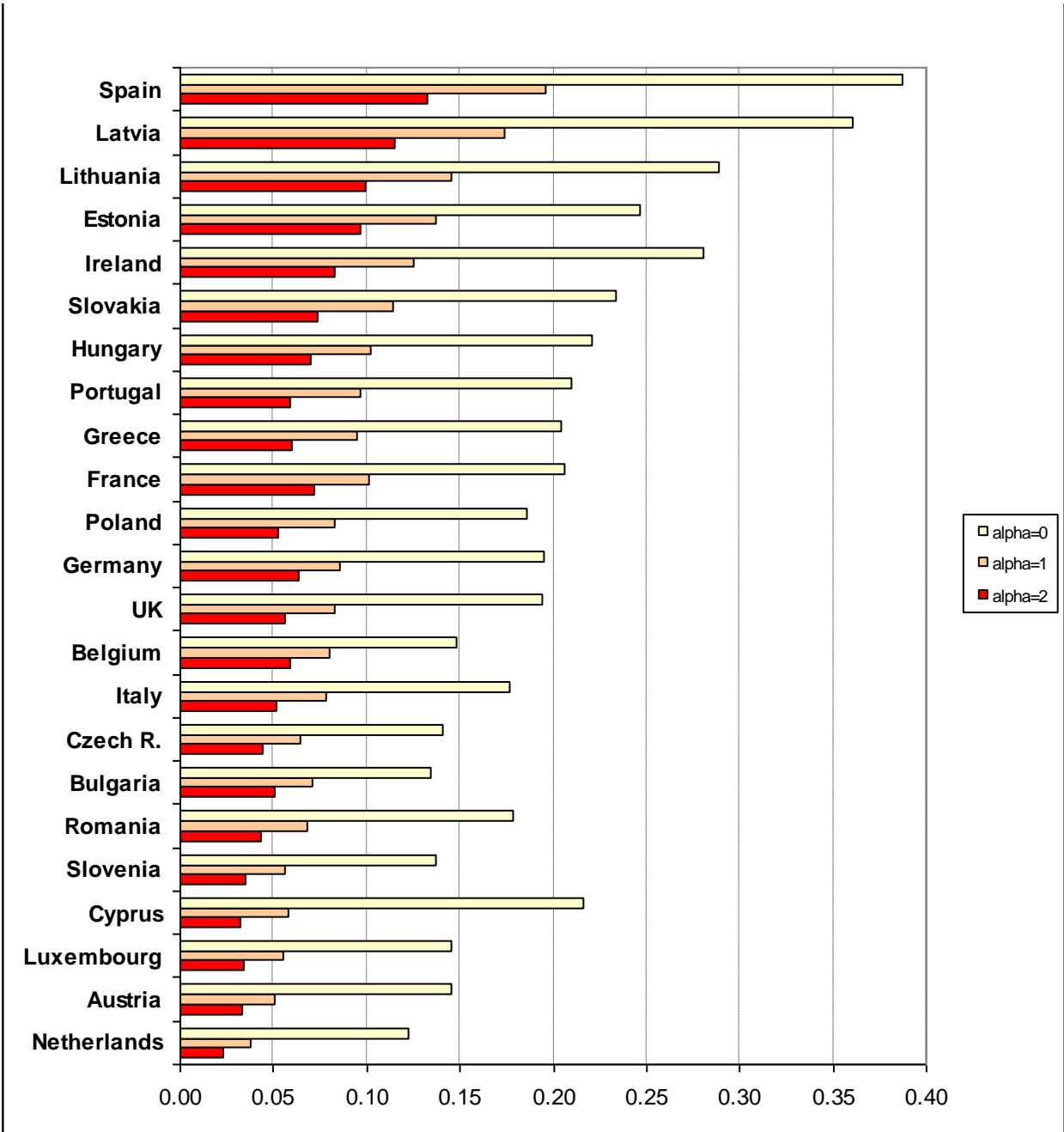


Figure 9. Aggregate household employment deprivation (with underemployment), 2009

$\gamma = 2$



Conclusions (methodological)

- We have proposed a **framework for measuring deprivation of households from employment** that embraces, as particular cases, the conventional unemployment rate and the most usual indicators of jobless households.
- For that purpose, we have proposed a family of measures rooted in the **measurement of well-being** so that the level of household deprivation from employment is obtained by first accounting for the incidence of unemployment (or, more generally, underemployment) within households, and then aggregating household's deprivation into a global measure.
- Both household-level and aggregate measures verify several **properties** which are consistent with how well-being is measured in other dimensions such as poverty or discrimination.
 - More specifically, they take into account the incidence, intensity and inequality of employment deprivation.

Conclusions (empirical)

- In general, those countries with the **largest (lowest) levels** of unemployment rate are also those with the highest (lowest) household employment deprivation.
- At **intermediate levels**, however, there are countries with similar unemployment rates that differ in their patterns of household employment deprivation.
 - Germany and Belgium, compared with UK and Italy, have low incidence of household employment deprivation, but high levels of both intensity, and inequality of deprivation among the deprived households.
 - Considering underemployment,
 - substantially reduces intensity and inequality in Germany
 - a much smaller effect in Spain or Latvia, with also high levels of underemployment in the European context.
- Different nature of increasing unemployment 2007-09:
 - mostly spreading out unemployment across the population (incidence) in Latvia,
 - also aggravating deprivation of households already touched by unemployment (increasing intensity and inequality) in Spain.

APPENDIX

Figure 1. Aggregate household employment deprivation index for EU countries in 2009

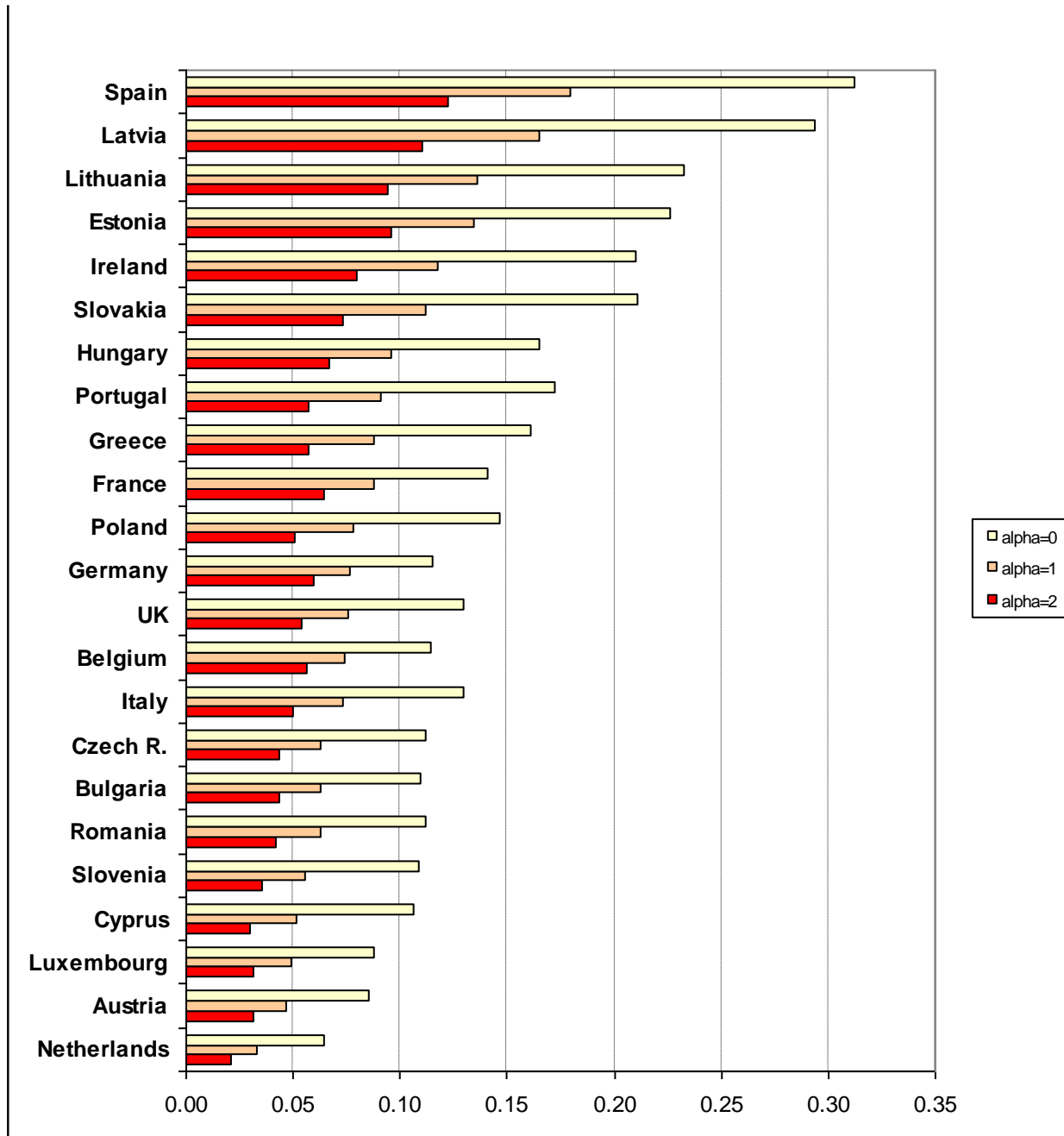


Figure 2. Decomposing the aggregate household employment deprivation index (alpha=2) for EU countries in 2009

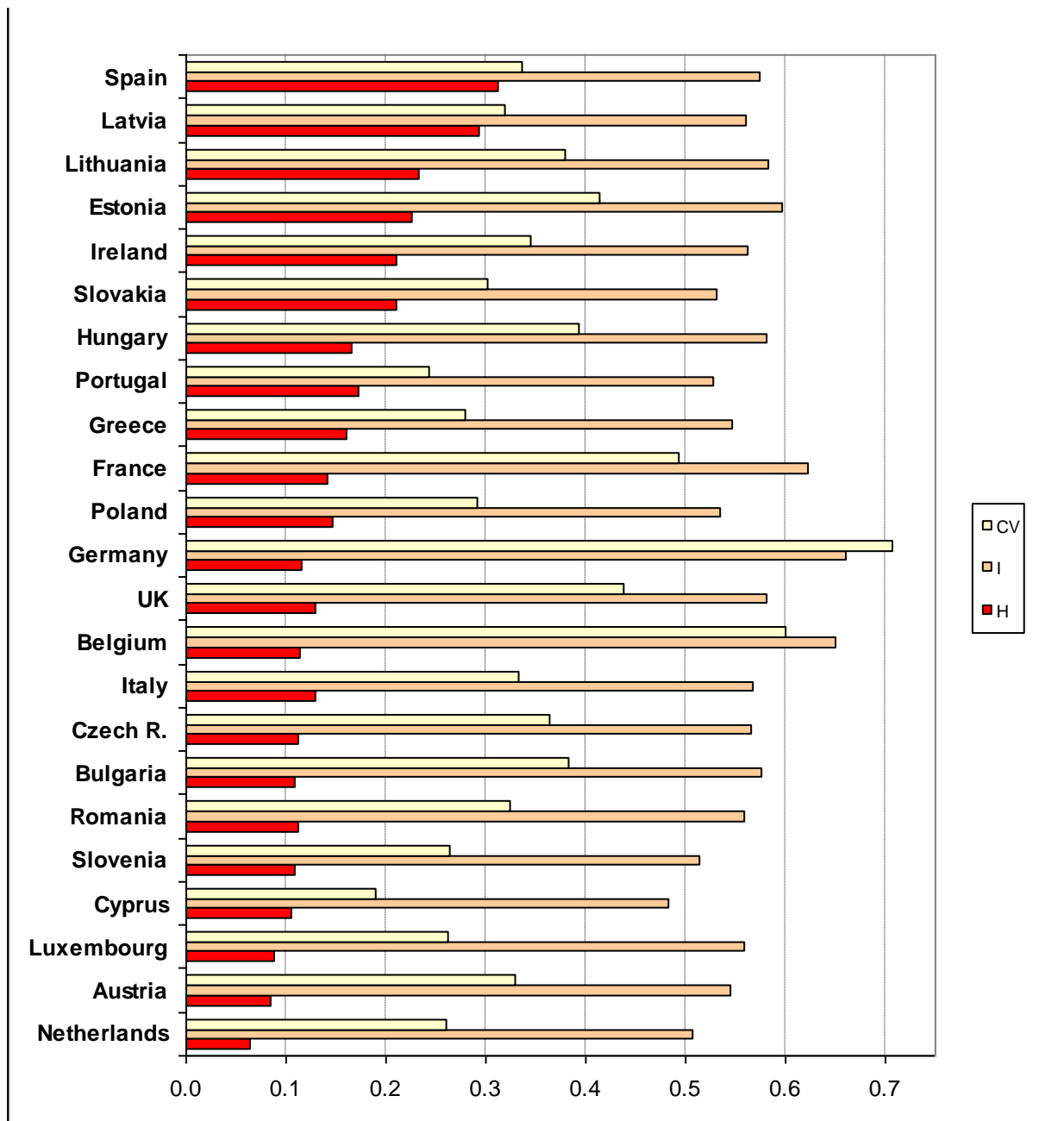


Figure 3. Decomposing the aggregate household employment deprivation index (alpha=2) for EU countries in 2009 relative to the unweighted average

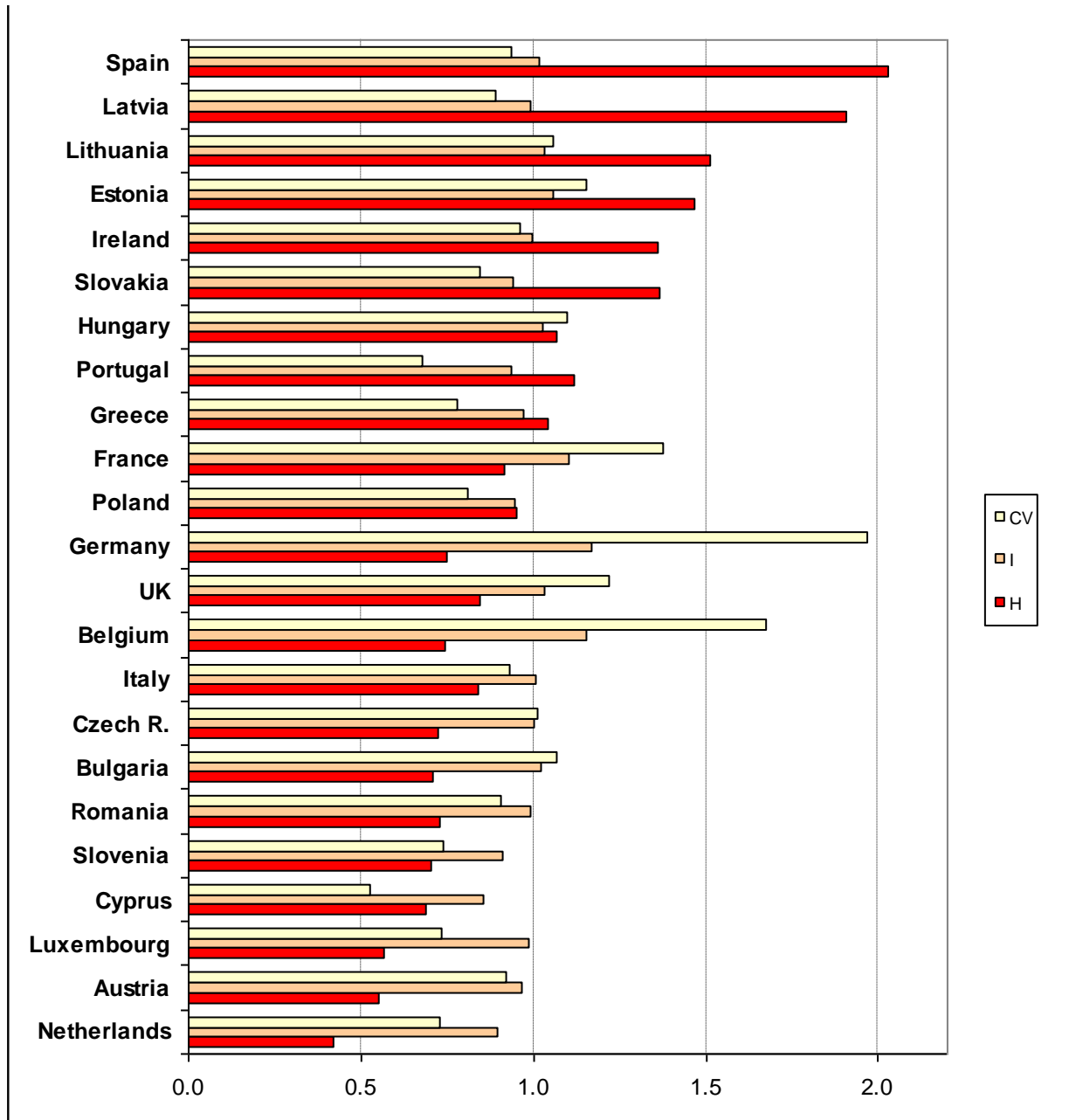


Figure 4. Aggregate household employment deprivation index for EU countries in 2009 relative to the unweighted mean

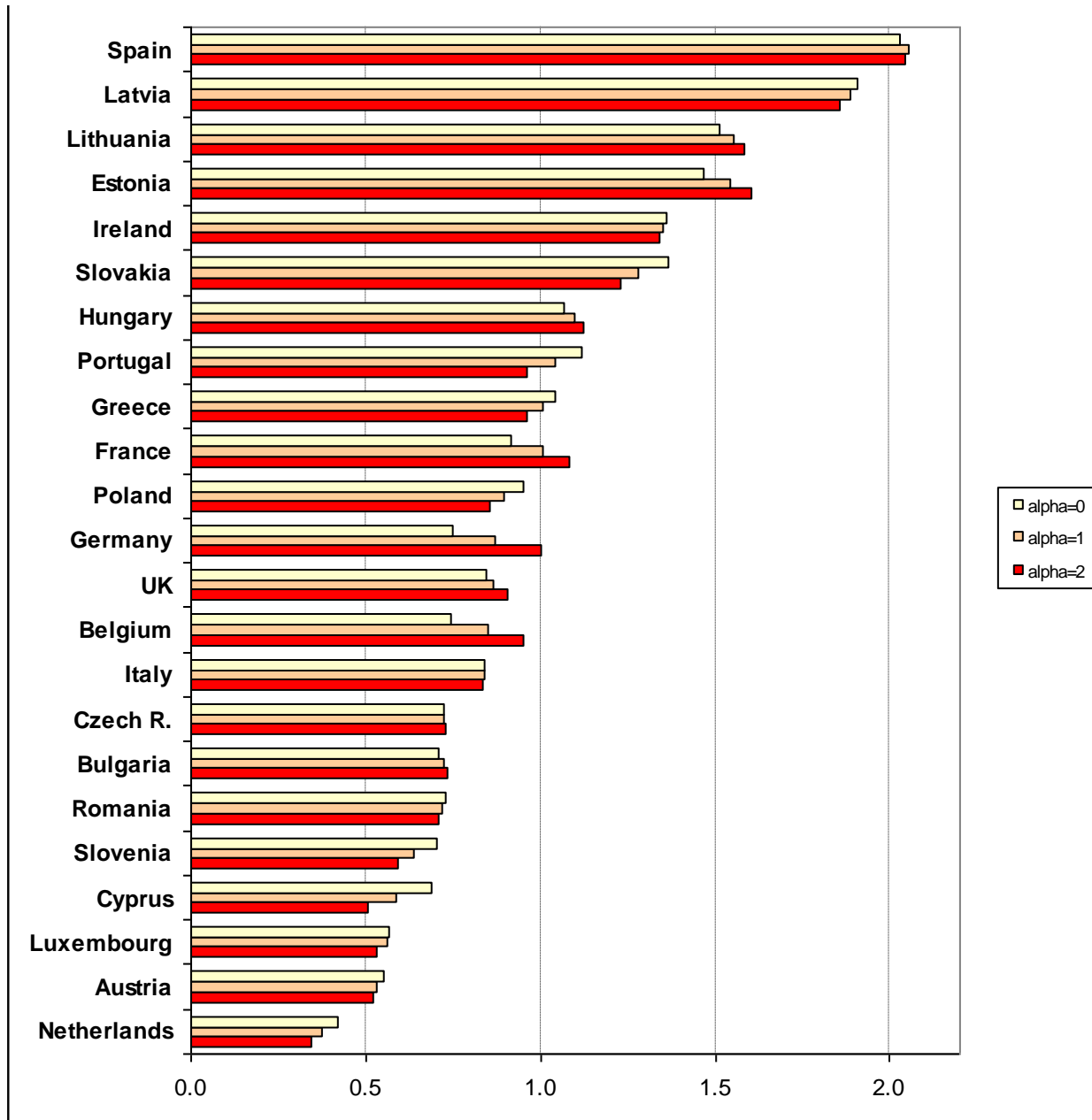


Figure 5. Percentage of variation of the aggregate household employment deprivation index for EU countries: 2007-2009

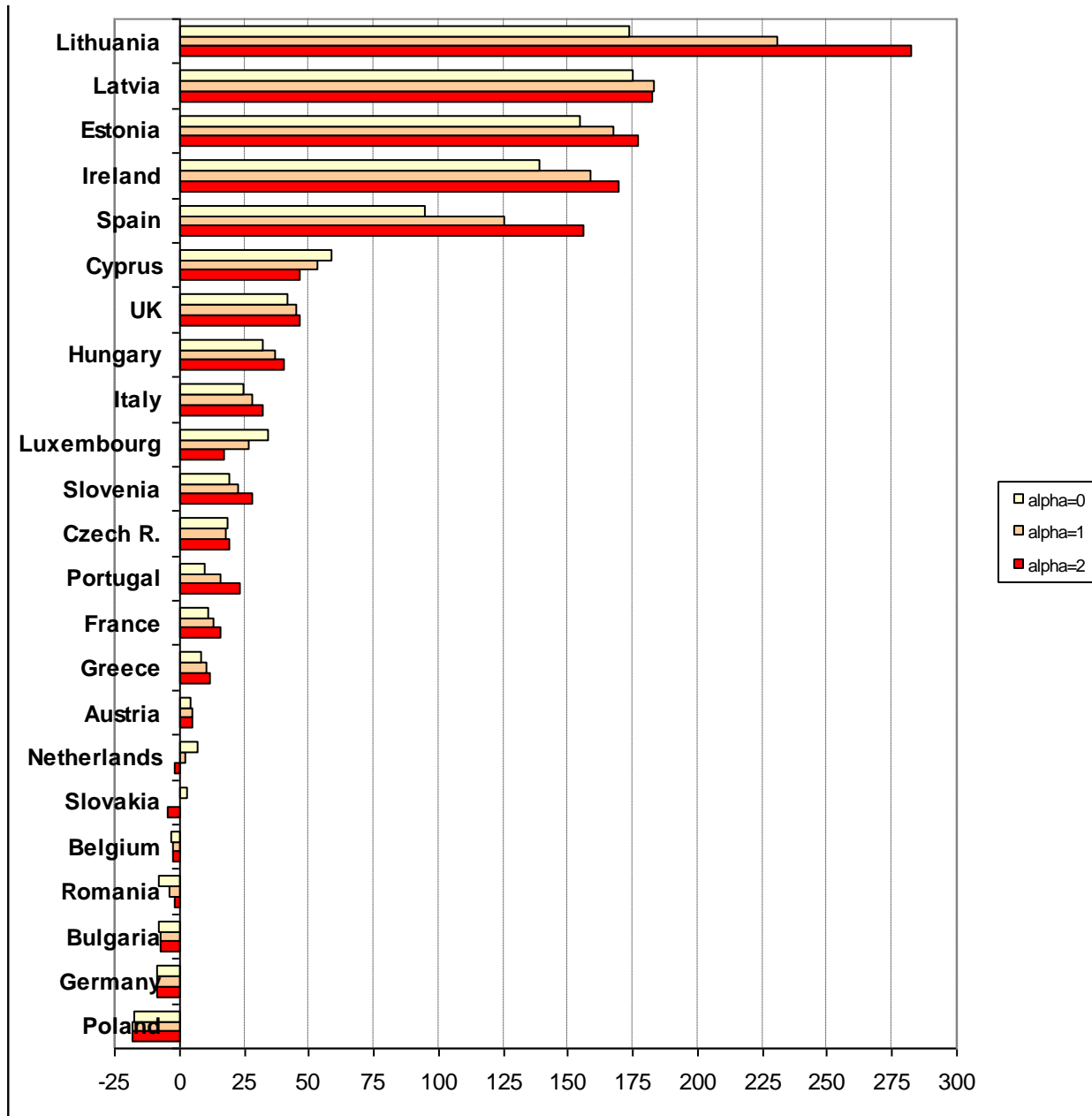


Figure 6. Percentage of variation in incidence, intensity and inequality of employment deprivation index for EU countries: 2007-2009

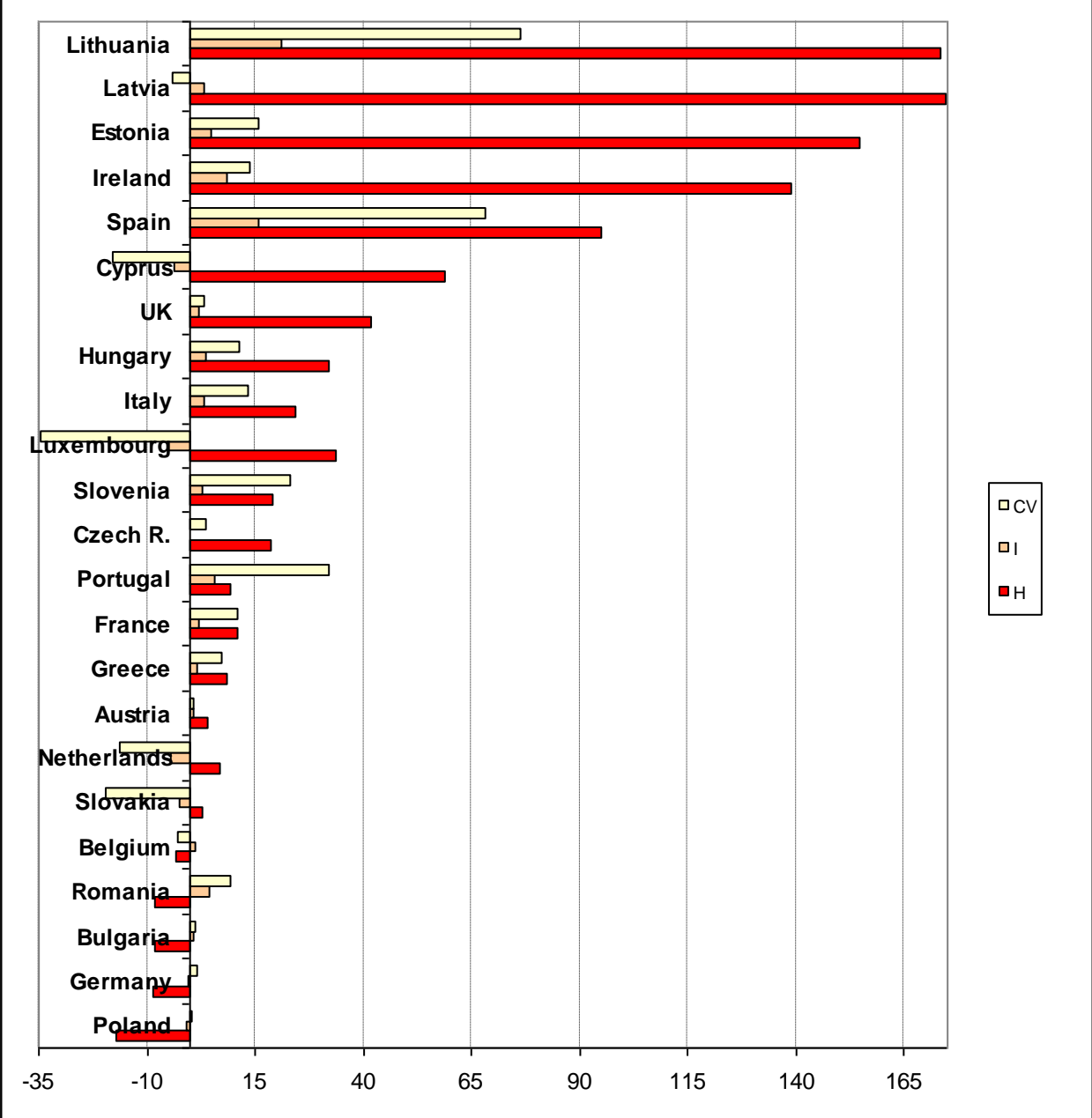


Figure 7. Change in aggregate household employment deprivation (with underemployment), 2009

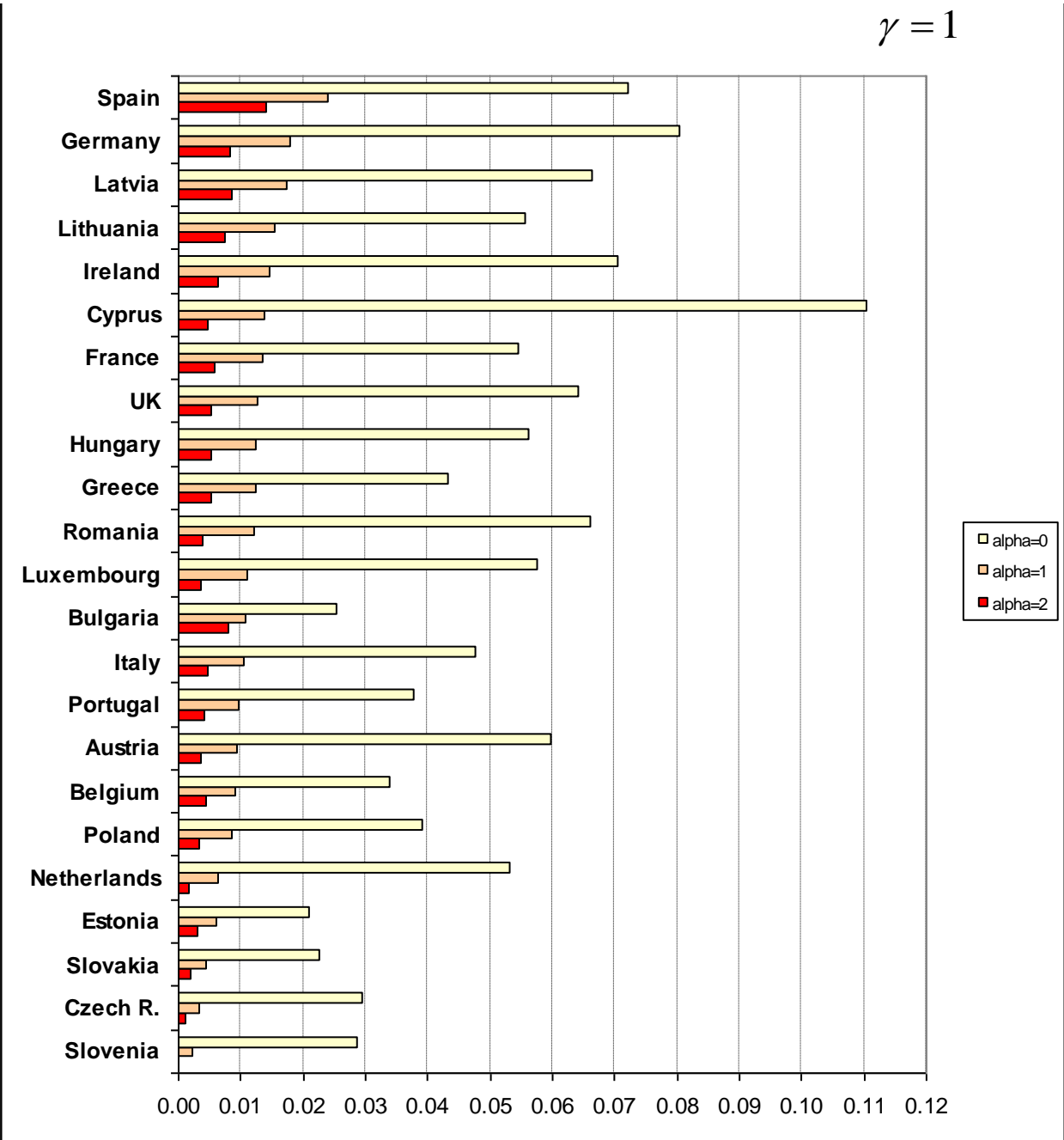


Figure 8. Change in the incidence, intensity and inequality components of aggregate household employment deprivation (with underemployment), 2009 $\gamma = 1$ $\alpha = 2$

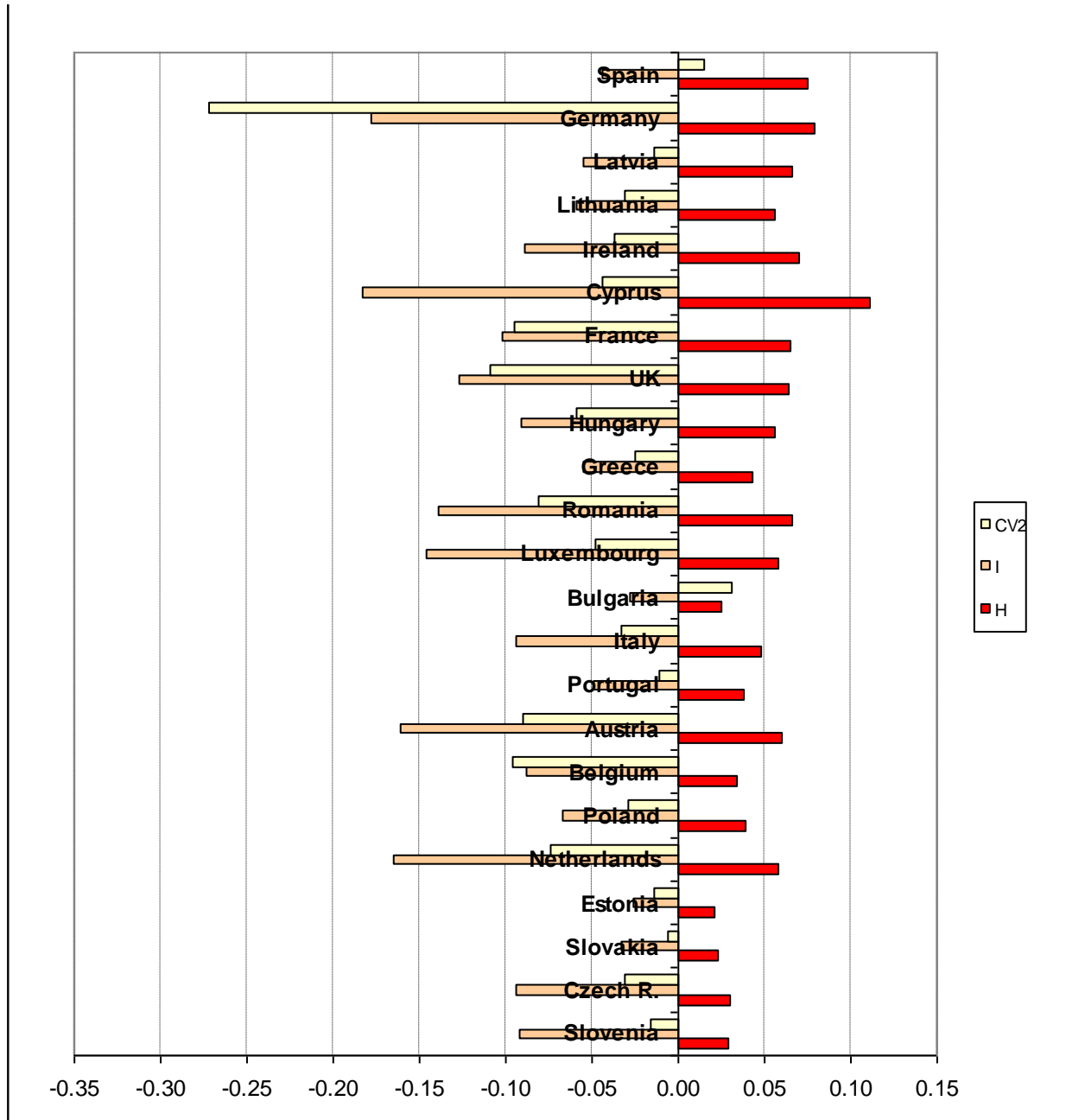
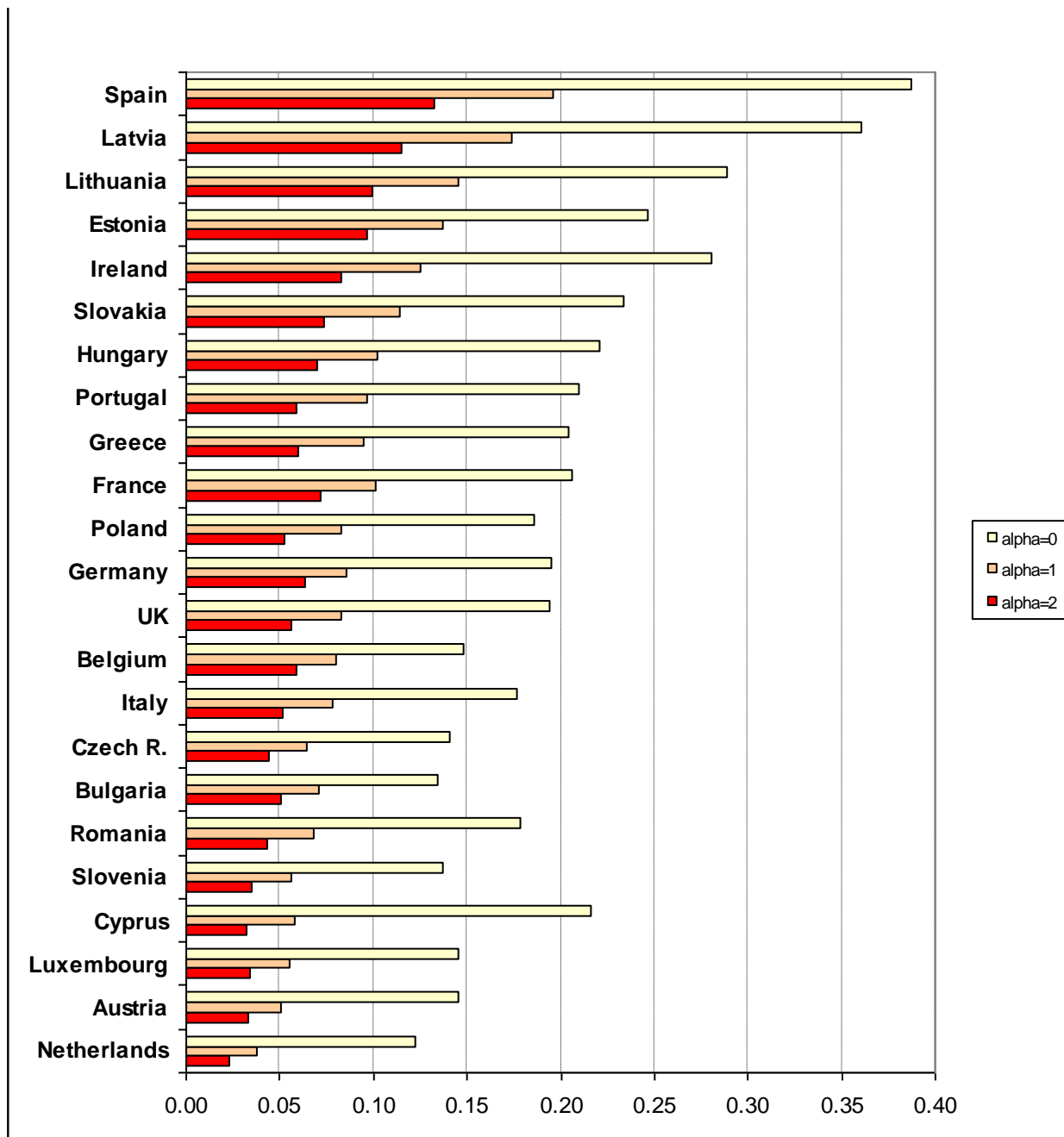


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$\gamma = 2$



Distribution of household employment deprivation

