Financial deepening and income distribution inequality in the euro area*

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Abstract

The paper introduces a new specification of the Kuznets curve, where turning point per capita income is conditioned to the level of financial development. It then yields new evidence on real income convergence for euro area (EA) countries since the mid-1980s, with a special focus on the effects of the subprime and sovereign debt financial crises. We find strong evidence in favor of an EA-wide *steady-state financial Kuznets curve* and of ongoing convergence across EA members toward a common per capita income turning point level. By means of a counterfactual analysis, we also detect a worsening in income inequality for all the EA countries during the financial crises. From a policy perspective, our findings highlight the importance of financial stability in fostering not only economic growth, but also a more even distribution of income.

Keywords: Euro area; financial development; financial stability; income distribution inequality; Kuznets curve; real convergence; subprime mortgage and sovereign debt crisis.

JEL classification: G20, G28, O11, O15, O16.

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1 Introduction

Recent contributions to the Kuznets (1955) curve literature explain its inverse-U shape through the adoption of new technologies, shifting the economy from an unsophisticated to a modern financial system, strictly dependent on banking activities and stock markets (Greenwood and Jovanovic, 1990; Barro, 2000; Aghion and Howitt, 1997). In this framework, financial development leads to a more even distribution of income by allowing access to finance to a larger population share (Greenwood and Jovanovic, 1990; Smith, 2003; Deidda, 2006; Townsend and Ueda, 2006; Kim and Lin, 2011).[1] Financial development also contributes to economic growth through improved physical and human capital accumulation and technological innovation (Smith, 2003; Beck et al., 2000). Due to informational asymmetries, technological progress can however make screening tools in the financial industry outdated, in turn requiring financial innovation to maintain the effective selection of profitable investment projects, and therefore its contribution to economic growth (Laeven et al., 2015).

Supporting empirical evidence for the above *long-term* view has been found by various cross-sectional (*between*) analyses and panel data studies using multi-year averaging to control for business cycle effects (Beck et al., 2007; Kappel, 2010; Li et al., 1998; Clarke et al., 2006). Nonlinearities such as threshold and asymmetric effects have also been documented. For instance, through an inverse-U shaped relationship, financial development might lead to a contraction in income inequality only once a threshold level is achieved; moreover, financial deepening decreases inequality more strongly for high rather than low-income countries (Kim and Lin, 2011; Kappel, 2010). On the other hand, some contrasting evidence has been yielded by cross-sectional *within* analyses, pooled dynamic panel data and time series studies within a *short-term* perspective (Jaumotte et al., 2008; Jauch and Watzka, 2012; Rodriguez-Pose and Tselios, 2009; Roine et al., 2009; Gimet and Lagoarde-Segot, 2011; Beltratti and Morana, 2007).

In light of the above evidence, the paper proposes a new specification of the Kuznets curve (KC), conditioning its turning point per capita income to the level of financial development. Within this framework, financial development contributes to a more even distribution of income by lowering the turning point per capita income level. Our specification is then a major contribution to the literature, since in previous studies financial deepening enters the KC specification at most as an ancillary variable (Lee, 2006; Barrios and Strobl, 2009; Beck et al., 2007; Rodrıguez-Pose and Tselios, 2009; Roine et al., 2009; Jauch and Watzka, 2012).

Also innovative is the econometric framework employed for the analysis, as we implement a new frequentist model averaging estimation strategy (M.A.S.; Morana, 2015). By jointly exploiting all the information available in various proxy variables for financial deepening and income inequality, and relying on more degrees of freedom, M.A.S. yields robust, consistent and relatively more efficient estimation than available competing econometric approaches, granting an accurate assessment of the linkages of interest.

In light of recent trends in income distribution inequality for the euro area (EA), pointing to a 2.5% average increase over the period 2008 through 2013 (see also Bertola, 2013; D'Errico et al., 2015), our empirical analysis is then focused on real within-country income convergence for the current 19 EA member states. By covering the most relevant events in the European Monetary System and Union history, such as the removal of all restrictions to capital flows between member states in 1990, the EMS crisis in 1992 and 1993, the introduction of the Maastricht Treaty in 1993 and the Stability Pact in 1997, the introduction of the Euro in 1999, the subprime financial crisis in 2007 and ensuing Great Recession, as well as the EA sovereign

[1] As financial intermediation is costly, in an unsophisticated financial system only the rich initially benefit from better financial markets, while the poor have to rely on informal, family connections for funding. Yet, once the diffusion of financial intermediation throughout society has sufficiently progressed, financial deepening leads to a more even distribution of income by lowering information and transaction costs, and allowing access to financial services to agents (small firms; the poor) who, due to a lack of collateral and credit histories, are severely constrained by inherited wealth.

debt crisis in 2010, the assessed sample is highly informative on the various dimensions through which financial deepening and income inequality might be interrelated. To our knowledge, the subprime plus sovereign debt crisis period has yet to be fully investigated in the financial development-income inequality literature, as the most up to date sample assessed ends in 2008 (Jauch and Watza, 2012).

To preview the results of the paper, we find empirical evidence in favor of an EA-wide *steady-state financial Kuznets curve* (FKC), i.e., of a long-term, inverse-U shaped linkage between income inequality and economic development, where financial deepening contributes to a more even distribution of income by lowering the turning point per capita income level. We also interpret the findings as evidence of ongoing across-country convergence toward a common turning point real per capita income level. The latter link would not have been undermined by the recent financial crises, which have however sizably affected income distribution across euro area countries. In particular, by means of a counterfactual analysis we find higher inequality than would otherwise have occurred in a non-crisis scenario, not only for the countries that were most severely hit by the sovereign debt crisis, (Cyprus, Greece, Ireland, Italy, Portugal and Spain), but also for core EA countries (Austria, Belgium, Finland, France, Germany and Luxemburg). Consistent with previous evidence that excessive financialization is detrimental to growth (Borio and Lowe, 2004; Arcand et al., 2015), we finally detect a "*too much finance*" effect during the crises, pointing to inequality falling as financial deepening increases up to a threshold value of 90-100 GDP points, then rising as financial development progresses beyond the threshold; coherently, the countries that were most affected by the sovereign debt crisis also show the highest figures for both variables.

The rest of the paper is as follows. Section 2 deals with the specification and estimation of the financial Kuznets curve, while Sections 3 and 4 present data and estimation results. Empirical properties of the EA FKCs and convergence issues are then discussed in Section 5, while the implications of the recent financial crises for income distribution are investigated in Section 6. Finally, conclusions and policy recommendations are reported in Section 7. Additional details are contained in the online Appendix.

2 Specification and estimation of the financial Kuznets curve

2.1 The financial Kuznets curve

Consider the model

$$y_n = a_n + bx_n + cx_n^2 \tag{1}$$

where n refers to the n-th country, $n = 1, ..., N$, y_n is a measure of income inequality, i.e., the Gini Index, x_n is a wealth/economic development indicator, i.e., the real per capita income/GDP level, a_n is a country-fixed effect. Coefficients b and c obey the restrictions $b > 0$ and $c < 0$, in order (1) to be consistent with the inverse-U shaped relationship posited by Kuznets (1955).

The KC turning point ($x_n^\star$) can then be obtained by maximizing (1) with respect to x_n, yielding

$$x_n^\star = -\frac{b}{2c}. \tag{2}$$

Following Bradford et al. (2005), by differentiating (1) with respect to time and substituting (2) it is obtained

$$\begin{aligned} \frac{\partial y_n}{\partial t} &= (b + 2cx_n)\frac{\partial x_n}{\partial t} \\ &= \alpha(x_n - x_n{}^\star)g_n \end{aligned} \tag{3}$$

where $\alpha \equiv 2c < 0$ and $g_n \equiv \frac{\partial x_n}{\partial t}$ is the (per capita) income growth rate in each country.

The instantaneous change in economic inequality then depends on the per capita income growth rate g_n and on the distance of x_n from its turning point ${x_n}^\star$; moreover, assuming $g_n > 0$, inequality increases when $x_n < {x_n}^\star$ and decreases when $x_n > {x_n}^\star$.

By conditioning the turning point per capita income in (2) to the level of financial development (f_n), i.e.,

$$ {x_n}^\star = \lambda_0 + \lambda_1 f_n \tag{4} $$

and substituting (4) in (3), one has

$$ \frac{\partial y_n}{\partial t} = \beta_0[x_n - (\lambda_0 + \lambda_1 f_n)]g_n \tag{5} $$

where λ_0 and λ_1 are parameters, with $\lambda_1 < 0$ implying that a country with more developed financial markets reaches the KC turning point at a relatively lower income level than a country with a less developed financial system.

2.2 Econometric specification

The econometric specifications used in our empirical analysis are then derived by integrating (5) over time.

In particular, the *linear* cross-sectional specification is

$$ y_n = \mu + \beta_0(x_n g_n) + \beta_1 g_n + \beta_2(f_n g_n) + \boldsymbol{\delta}'\mathbf{z}_n + \varepsilon_n, \qquad n = 1, ..., N \tag{6} $$

where μ is the intercept, $\beta_0 \equiv 2\alpha < 0$, as required by the inverse relationship between income inequality and the level of economic development posited by the KC; $\beta_2 \equiv -\beta_0\lambda_1 < 0$, consistent with the hypothesis of an inverse relationship between financial development and the turning point of the KC, while β_1 can take either positive or negative values, as well as the $k \times 1$ vector of parameters $\boldsymbol{\delta}$ corresponding to the k control variables $\mathbf{z}_n$; finally ε_n is a zero mean i.i.d. error term.

A log-log specification is also employed, i.e.,

$$ \ln y_n = \mu + \beta_0(\ln x_n g_n) + \beta_1 g_n + \beta_2(\ln f_n g_n) + \boldsymbol{\delta}' \ln \mathbf{z}_n + \varepsilon_n, \qquad n = 1, ..., N. \tag{7} $$

From the coefficients β_0, β_1 and β_2, the structural parameters of interest λ_0 and λ_1 can then be obtained as $\lambda_0 \equiv -\frac{\beta_1}{\beta_0}$ and $\lambda_1 \equiv -\frac{\beta_2}{\beta_0} < 0$.

2.3 Estimation

Neither income inequality nor financial development are uniquely measured. For instance, income inequality can be measured by the market or net income Gini Index or various top/bottom income distribution quantile ratios; financial development can be measured by the GDP shares of credit to the private sector, liquid liabilities, or stock market capitalization. The selection of a single proxy variable for income inequality and financial development might then be arbitrary and lead to non robust results, also in light of the small cross-sectional dimension available (19 countries/observations).

In order to deal with the above drawback, in the paper we have implemented *model averaging by stacking* estimation (M.A.S.; see Morana, 2015). Relative to alternative approaches, M.A.S. has the advantage of performing model averaging ex-ante in a single step, optimally selecting the model's weight according to the MSE metric; moreover, it is straightforward to implement, only requiring the estimation of a single augmented regression. By jointly exploiting ex-ante all the information available and benefiting from more degrees of freedom, the proposed approach yields robust, consistent and (relatively) more efficient estimation than available ex-post methods.

Hence, consider the regression function

$$\mathbf{y} = \mathbf{X}\boldsymbol{\beta} + \boldsymbol{\varepsilon} \tag{8}$$

and suppose that P candidate dependent variables $\mathbf{y}$ are available, i.e., $\mathbf{y}_1$, $\mathbf{y}_2$, ..., $\mathbf{y}_P$, where $\mathbf{y}_p$, $p = 1, .., P$, is a $N \times 1$ column vector of observations, as well as R candidates for *one* of the K regressors in the model, ordered first for simplicity, i.e., $\mathbf{x}_{1r}$, $r = 1, ..., R$, yielding up to R candidate design matrices $\mathbf{X}_r$ for $\mathbf{X}$.[2] Moreover, the usual properties of the classical linear regression function (asymptotic case) are assumed to hold.

In principle, up to $P \times R$ alternative disjoint models could be estimated and then averaged ex-post, i.e.,

$$\begin{aligned}
\mathbf{y}_1 &= \mathbf{X}_1\boldsymbol{\beta} + \boldsymbol{\varepsilon}_{1,1} \\
\mathbf{y}_1 &= \mathbf{X}_2\boldsymbol{\beta} + \boldsymbol{\varepsilon}_{1,2} \\
&\vdots \\
\mathbf{y}_1 &= \mathbf{X}_R\boldsymbol{\beta} + \boldsymbol{\varepsilon}_{1,R} \\
&\vdots \\
\mathbf{y}_P &= \mathbf{X}_1\boldsymbol{\beta} + \boldsymbol{\varepsilon}_{P,1} \\
\mathbf{y}_P &= \mathbf{X}_2\boldsymbol{\beta} + \boldsymbol{\varepsilon}_{P,2} \\
&\vdots \\
\mathbf{y}_P &= \mathbf{X}_R\boldsymbol{\beta} + \boldsymbol{\varepsilon}_{P,R.}
\end{aligned} \tag{9}$$

Their union yields the stacked model

$$\mathbf{y}_{\mathbf{P},\mathbf{R}} = \mathbf{X}_{\mathbf{P},\mathbf{R}}\boldsymbol{\beta} + \boldsymbol{\varepsilon}_{\mathbf{P},\mathbf{R}} \tag{10}$$

where $\boldsymbol{\beta}$ is the $K \times 1$ vector of parameters, $\mathbf{y}_{\mathbf{P},\mathbf{R}} = vec\left(\mathbf{i}_R \otimes \begin{bmatrix} \mathbf{y}_1 & \mathbf{y}_2 & ... & \mathbf{y}_P \end{bmatrix}\right)$ is the $(N \times P \times R) \times 1$ vector collecting the P $\mathbf{y}_p$ $(N \times 1)$ vectors, $p = 1, .., P$, which are then stacked on top of one another R times, vec is the vectorization operator, $\otimes$ is the Kronecker product and $\mathbf{i}_R$ a $R \times 1$ unitary vector.[3]

By denoting $\mathbf{X}_* = \begin{bmatrix} \mathbf{X}_1' & \mathbf{X}_2' & ... & \mathbf{X}_R' \end{bmatrix}'$ the $(R \times N) \times K$ matrix obtained by stacking the R candidate design matrices on top of one another, $\mathbf{X}_{\mathbf{P},\mathbf{R}}$ is then the $(P \times R \times N) \times K$ design matrix yield by stacking P times the matrix $\mathbf{X}_*$ on top of itself, i.e., $\mathbf{X}_{\mathbf{P},\mathbf{R}} = \begin{bmatrix} \mathbf{X}_*' & \mathbf{X}_*' & ... & \mathbf{X}_*' \end{bmatrix}'$. Finally, $\boldsymbol{\varepsilon}_{\mathbf{P},\mathbf{R}} = \begin{bmatrix} \boldsymbol{\varepsilon}_{1,1}' & ... & \boldsymbol{\varepsilon}_{1,R}' & ... & \boldsymbol{\varepsilon}_{P,1}' & ... & \boldsymbol{\varepsilon}_{P,R}' \end{bmatrix}'$ is a $(P \times R \times N) \times 1$ vector of residuals. Hence, the sample size of the stacked model is $S = N \times P \times R$.

The stacked OLS estimator is then computed as

$$\hat{\boldsymbol{\beta}}_{ea} = \left(\mathbf{X}_{\mathbf{P},\mathbf{R}}'\mathbf{X}_{\mathbf{P},\mathbf{R}}\right)^{-1} \mathbf{X}_{\mathbf{P},\mathbf{R}}'\mathbf{y}_{\mathbf{P},\mathbf{R}} \tag{11}$$

$$\tilde{\sigma}_{ea}^2 = \frac{\hat{\boldsymbol{\varepsilon}}_{\mathbf{P},\mathbf{R}}'\hat{\boldsymbol{\varepsilon}}_{\mathbf{P},\mathbf{R}}}{S}. \tag{12}$$

Moreover

$$\sqrt{S}\left(\hat{\boldsymbol{\beta}}_{ea} - \boldsymbol{\beta}\right) \xrightarrow{d} N\left(\mathbf{0}, \sigma^2 \mathrm{plim}\left(S^{-1}\mathbf{X}_{\mathbf{P},\mathbf{G}}'\mathbf{X}_{\mathbf{P},\mathbf{G}}\right)^{-1}\right)$$

and therefore

$$\hat{\boldsymbol{\beta}}_{ea} \overset{asy}{\sim} N\left(\boldsymbol{\beta}, \sigma^2\left(\mathbf{X}_{\mathbf{P},\mathbf{G}}'\mathbf{X}_{\mathbf{P},\mathbf{G}}\right)^{-1}\right).$$

[2] In our application, $P = R = 3$, as three measures of income inequality $\mathbf{y}_p$, as well as three measures of financial deepening $\mathbf{x}_{1r}$, are employed, yielding therefore up to $P \times R = 9$ alternative regression models.

[3] Hence, $\mathbf{y}_{\mathbf{P},\mathbf{G}} = \left[\underset{1\times(N\times R)}{\begin{pmatrix} \mathbf{y}_1' & \mathbf{y}_1' & ... & \mathbf{y}_1' \end{pmatrix}} \underset{1\times(N\times R)}{\begin{pmatrix} \mathbf{y}_2' & \mathbf{y}_2' & ... & \mathbf{y}_2' \end{pmatrix}} ... \underset{1\times(N\times R)}{\begin{pmatrix} \mathbf{y}_P' & \mathbf{y}_P' & ... & \mathbf{y}_P' \end{pmatrix}} \right]'$.

As shown by Morana (2015), the stacked OLS estimator in (11) and (12) can be stated as

$$\hat{\boldsymbol{\beta}}_{ea} = \sum_{r=1}^{G} \check{\mathbf{W}}_r^* \left(\frac{1}{P} \sum_{p=1}^{P} \hat{\boldsymbol{\beta}}_{p,r} \right)$$

$$\tilde{\sigma}_{ea}^2 = \frac{1}{G} \sum_{r=1}^{G} \frac{1}{P} \sum_{p=1}^{P} \tilde{\sigma}_{p,r}^2 \qquad (13)$$

where $\sum_{r=1}^{G} \check{\mathbf{W}}_r^* = \sum_{r=1}^{G} \left[\mathbf{X}_r'\mathbf{X}_r + \mathbf{K}_r\right]^{-1} (\mathbf{X}_r'\mathbf{X}_r) = \mathbf{I}_K$ and $\mathbf{K}_r = \sum_{i=1,\, i\neq r}^{G} \mathbf{X}_i'\mathbf{X}_i$; $\hat{\boldsymbol{\beta}}_{p,r} = (\mathbf{X}_r'\mathbf{X}_r)^{-1} \mathbf{X}_r'\mathbf{y}_p$ and $\tilde{\sigma}_{p,r}^2 = \frac{\hat{\boldsymbol{\varepsilon}}_{p,r}'\hat{\boldsymbol{\varepsilon}}_{p,r}}{T}$. The MSE-optimal ex-ante weights, contained in the $K \times K$ matrices $\check{\mathbf{W}}_r^*$, $r = 1, ..., R$, are then computed by taking into account all the information available on the various candidate regressors and are proportional to their relative variation. Ex-ante model averaging estimation of the slope vector $\hat{\boldsymbol{\beta}}_{ea}$ is then computed across all the possible $P \times R$ disjoint estimators $\hat{\boldsymbol{\beta}}_{p,r}$. Similarly for ex-ante model averaging estimation of the variance $\tilde{\sigma}_{ea}^2$, which is equivalent to the arithmetic average of all the $P \times R$ disjoint estimators $\tilde{\sigma}_{p,r}^2$. In contrast to ex-post model averaging, which would be implemented through a multi-step procedure, requiring the estimation of all the $P \times R$ alternative models, yet without granting the use of MSE-optimal weights, the M.A.S. estimator in (11) and (12) yields MSE-optimal model averaging, ex-ante, in a single step. Extension to GMM estimation, also considered in this paper, is straightforward, requiring coherent stacking of the instruments. See Morana (2015) for details, also for the case of violation of the hypothesis of conditional homoskedasticity.

3 The data

The dataset is an unbalanced panel of annual observations for the 19 current euro area member countries, covering the period 1985 through 2013 ($N = 19$ and $T = 28$), i.e., Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxemburg, Malta, the Netherlands, Portugal, Slovakia, Slovenia and Spain.[4]

Income inequality (y) is measured by means of the *market* (GM) and *net income* (GN) Gini Index, computed by using household market and disposable income (post-tax, post-transfer), respectively, as reported in the Standardized World Income Inequality Database (SWIID). In light of its wide use in the empirical literature, the net income Gini Index (GW), reported in the World Income Inequality Database (WIID), is also employed in the analysis. The latter variables are then stacked to yield a single inequality indicator.

The level of economic development is measured by real per capita GDP (x) at year 2005 constant prices. Moreover, three distinct proxies for financial development (f) are employed, i.e., the GDP shares of credit to the private sector (c), of liquid liabilities (m) and of stock market capitalization (s). These variables have been widely employed as *alternative* measures of financial depth in the literature; rather we use them *simultaneously*, by stacking the three indicators in a single variable, as for the Gini Index.

Furthermore, in order to account for the influence of factors other than economic growth and financial development on income inequality, different control variables are included, i.e., the *age dependency ratio* (DEP); the GDP share of *government spending* (PE), the *spread* between the interest rate on 10-year government bonds relative to the interest rate paid on 10-year German Treasury bonds (SPR); *globalization/trade openness* (TRD), as measured by the GDP share of exports plus imports; the *population share living in urban areas* (URB). Concerning their

[4] For Slovakia, Slovenia, Estonia and Lithuania a smaller data set is available, observations starting in 1992, 1995, 1995 and 1991, respectively.

effects, consistent with the available literature (see, for instance, Bergh and Nilsson, 2010) we expect an increase in the size of public expenditure and a more generous welfare system (PE, SPR) to lead to a more equal distribution of income; similarly for an increase in the share of the population living in urban areas (URB), through the growth enhancing effect of urbanization. On the other hand, we expect an increase in trade openness (TRD) to yield a worsening in income distribution, due to the downward pressure effect on the wage of unskilled workers exerted by globalization. Similarly for a higher dependency ratio (DEP), signaling a larger share of the population without a regular wage.

Due to stationarity properties, sample averages for the Gini Index (GM, GN, GW) and control variables are employed for the estimation of (6) and (7); variables x, c, m and s are measured at mid-sample (year 2000) trend values; g is computed as the average growth rate of trend real per capita income (x). These transformations of the original series allow us to set the analysis within a long-term perspective as in Bradford et al. (2005). Having filtered out short-lived fluctuations, potentially related to various forms of instability, the data employed in the analysis are then coherent with a framework where *financial development* is associated with prevailing *economic* and *financial stability*. Finally, estimation is performed using standardized data.[5]

4 Empirical results

The results of the estimated cross-sectional regressions are reported in Table 1, columns 1-4 and 5-8, for the linear and log-log specifications, respectively. Different models, obtained by varying the set of included control variables (DEP, PE, SPR, TRD, URB), are estimated. Heteroskedasticity consistent standard errors are reported in all cases.

As shown in the Table, parameter estimates are consistent with the underlying theoretical framework, pointing to an inverse-U shaped linkage between inequality and the level of economic development (β_0 parameter) and an inverse linkage between the turning point per capita income level and financial deepening (β_2 parameter). In particular, concerning the KC hypothesis, the estimated β_0 parameter is, as expected, negative and statistically significant for both the linear and log-log specifications, equal to -0.329 and -0.274, respectively, for our preferred models, selected according to statistical significance and explanatory power (column 4, for the linear model; column 6, for the log-log model). Moreover, the inverse relationship between the KC turning point per capita income level and the level of financial development is also clear-cut, as the estimated β_2 parameter is negative and statistically significant across specifications, equal to -0.337 and -0.243, for the selected linear and log-log models, respectively.

Coherently, OLS estimates of the structural parameter of interest $\lambda_1 \equiv -\frac{\beta_2}{\beta_0}$ are, as expected, negative in sign, about -1.024 and -0.887 for the selected linear and log-log models, respectively. Financial development would then contribute to a more even distribution of income in the EA by lowering the KC turning point per capita income level; we interpret the latter finding also as evidence of ongoing convergence across EA member states, toward a common KC turning point per capita income level.

The findings are robust to specification choices in terms of control variables. In fact, while point estimates for β_0 and β_2 somewhat differ across models, particularly when columns 1 and 2 (5 and 6) are compared with columns 3 and 4 (7 and 8), a Bonferroni bounds test (not reported), carried out considering the six different combinations of the available four models, does not allow the rejection, even at the 20% significance level, the null of equal coefficients across models, for both parameters.[6]

[5] See the online Appendix for further details on data and filtering.

[6] In fact, concerning β_0, the minimum p-value of the test are 0.052 for the linear model and 0.399 for the log-log model, to be compared with a threshold p-value equal to 0.033 in both cases. Moreover, concerning β_2, p-values are 0.454 and 0.633, respectively, still to be compared with a 0.033 threshold value.

On the other hand, point estimates of β_1 sizably differs across models, i.e., -0.220 and -0.070 for the selected linear and log-log models, respectively, yielding OLS estimates of the structural parameter $\lambda_0 \equiv -\frac{\beta_1}{\beta_0}$ equal to -0.669 and -0.225, respectively.

Finally, concerning control variables, differences can be noted between the linear and log-log models. In fact, while all the control variables are significant for the linear model, only DEP, PE and SPR have been retained in the log-log specification, the inclusion of URB and TRD then possibly controlling for features (nonlinearity) neglected in the linear model, yet accounted for by the log-log model. In all cases, however, signs are consistent with expectations, as an increase in PE, SPR and in URB leads to a more even distribution of income, while an increase in DEP and TRD to a worsening in income equality.

As shown in the online Appendix and in Figure 1, M.A.S. estimates are within the interquartile range of the OLS estimates obtained by means of all the possible submodels embedded in the stacked model, therefore yielding, as expected, a description of the assessed linkage robust to specification choices.[7] OLS results are also robust to measurement error and causality assumptions concerning the linkage between financial development and inequality. In fact, as shown in the online Appendix, when compared with GMM estimates (Table A1), OLS estimates do not show any evidence of misspecification or endogeneity bias. In this respect, the OLS log-log model turns out to be the preferred model, therefore selected and employed for the rest of the analysis. See the Appendix for details.

5 Empirical properties of the financial Kuznets curve

Two main conclusions can be drawn from the above empirical results. Firstly, there is evidence of an inverse-U shaped *steady-state* relationship between inequality and economic development for the EA, showing income inequality decreasing as a certain threshold in economic development is passed; the latter threshold is inversely related to the degree of financial deepening. Secondly, and as a consequence, there is evidence of ongoing convergence across EA member countries toward a common turning point per capita income level, as determined by the progressive diffusion of financial development. However, as it will be shown below, beyond a certain threshold value (90-100 GDP points) a *too much finance* effect can manifest, i.e., financial deepening might become detrimental to growth and equality (Borio and Lowe, 2004; Arcand et al. , 2015). The financial development threshold value then implicitly defines the steady-state turning point per capita income level toward which convergence occurs *ceteris paribus*. In this Section we provide further details on both issues. See the online Appendix for technical details concerning computations below.

5.1 EA-wide steady-state FKC properties

On the basis of the estimated structural parameters λ_0 and λ_1, the turning point of the EA-wide *steady-state* FKC (SS-FKC) is computed using (4). As shown in Table 2 (Panel A), the selected OLS log-log model estimate of the turning point is about €13,000, while the estimated dispersion across estimates is €1,200 ($\hat{x}^*$: €$13,279$ $(1,207)$). Moreover, the net and market Gini Index at the turning point, obtained from (1), are about 30% and 49%, respectively ($\hat{y}^*_{GN}$: 31%; $\hat{y}^*_{GW}$: 32.2%; $\hat{y}^*_{GM}$: 48.5%).[8]

In Figure 2 we plot the estimated EA-wide SS-FKC, obtained through cubic spline interpolation of the cross plots of the predicted Gini Index against (across-country year-2000) the trend real per capita income values. The estimated curve is well behaved, showing the expected

[7] Details on the estimated models are available upon request from the authors.

[8] As shown in Appendix, the estimated turning point ($\hat{x}^*$) is strongly robust to the method employed (OLS, GMM), falling in the range €11,600-€11,800 for the linear model and €13,300-€14,300 for the log-log model. Similarly for the predicted Gini values at the turning point.

inverse-U shape, still asymmetric, as income inequality grows faster when per capita income increases toward the turning point than it decreases once the threshold is passed.

5.2 EA member countries steady-state FKC properties

By assuming the same structural parameters as holding for the EA-wide SS-FKC, the turning point for each EA member country SS-FKC can also be computed from (4). Comparison between own-country and area-wide SS-FKCs yields information on the degree of *transitory* divergence across EA member states. The latter is deemed to be transitory in light of the existence of an EA-wide SS-FKC, and therefore of ongoing convergence toward its turning point, as determined by financial deepening.

In Figure 3, we plot the cross-plot of the estimated own-country SS-FKC turning points ($\hat{x}_n^*$) against the corresponding financial development level ($\hat{f}_n^*$), computed as the average of the three financial deepening indicators for each country, measured at mid-sample (year 2000) trend values. Corresponding figures for the EA-wide SS-FKC are also reported for comparison ($\hat{x}^*$: 13,279; $\hat{f}\,^*$: 82.2).

Projecting on the x- and y-axis from the EA-wide SS-FKC values $\hat{x}^*$ and $\hat{f}^*$, the FKC turning point per capita income-financial development space is divided into four regions, i.e., high (low) per capita income and high (low) financial development, high (low) per capita income and low (high) financial development. As shown in Figure 3, the two former regions are empty, due to the inverse relationship between income turning points and financial development.

EA countries can then be clustered into two groups. The first group (DEV) shows high financial development and low SS-FKC turning point per capita income level; it is composed of the original EA members, i.e., Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxemburg, Portugal, Spain.[9] The second group (UDV) shows low financial development and a high SS-FKC turning point per capita income level; it is composed of the most recent member states, i.e., Cyprus, Estonia, Latvia, Lithuania, Cyprus, Malta, Slovakia and Slovenia.

In light of the above evidence, we then average across the two groups of countries, to obtain overall representative figures for the SS-FKC turning point per capita income levels ($\hat{x}^*_{DEV}$ and $\hat{x}^*_{UDV}$). Due to their outlying behavior, trimmed averages, discarding observations for the Netherlands and Lithuania, are also computed.[10]

As shown in Table 2 (Panel B), (OLS log-log model) reference estimates of the turning point for the two groups of countries are about €10,000 for DEV and €16,000 for UDV, coherent with a financial development gap, between the two groups, of about 23 GDP points. Hence, a -22% contraction in the turning point value might be achievable for the new member countries, through further financial development, down to about €13,000, as estimated for the EA-wide SS-FKC. The contraction in income inequality for UDV countries would also be sizable, particularly when assessed by means of the market income Gini Index GM, i.e., -4%, from 53% to 49% (-2.4% for the net income Gini Index GN).

5.3 Implied inequality values by the EA own-country steady-state FKCs

Predicted Gini index values for the EA member countries can also be computed from (1). In Figure 4 we plot the (OLS log-log model) estimated EA own-country SS-FKCs, obtained through cubic spline interpolation of the cross-plots of the predicted Gini index values against (own-country) trend real per capita income. As is shown in the plots, the two groups of relatively

[9] The outlying behavior shown by the Netherlands is not surprising, due to the historically low values for GDP shares of liquid liabilities and private credit, relative to the other core euro area members. This is also evident from the estimation of the own-country steady-state FKC, the latter country turning out to be located on its upward sloped portion and showing a negative excess inequality during the crisis (see below).

[10] Lithuania has joined the EA only in December 2015; therefore, it does not actually belong to the EA during the period considered.

more and less advanced countries can again be singled out. The former group, composed of Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxemburg, Portugal, Spain, as well as Cyprus and Slovenia, coherently shows a downward sloping FKC trend per capita income ($DSFKC$), implicitly exceeding turning point levels since the mid-1980s. On the other hand, an upward sloping FKC can be noted for the latter group, composed of Estonia, Latvia, Lithuania, Malta and Slovakia ($USFKC$). Income inequality can then be expected to fall (increase) as economic growth further progresses for the group of more (less) developed EA countries, *ceteris paribus*.

6 Financial crisis and inequality

The analysis carried out in the previous Section is set within a long-term perspective, where financial deepening exerts a positive effect on economic growth. Within this perspective, financial development does not endanger economic stability through the generation of boom-bust financial cycles.

As shown by recent events, financial imbalances can however trigger sizable short-term fluctuations: real EA GDP contracted -5.9% during the subprime mortgage cum sovereign debt crisis (-4.7% in 2009; -1.2% in 2012-2013). In Table 3 we report figures for the level and rate of growth of the Gini Index during the crisis. In particular, income inequality is computed as the average Gini Index level over the period 2008-2013 (GN, GW, GM), while its rate of change as the relative deviation of the latter average figure from its actual value in 2007 ($GN_{\%}$, $GW_{\%}$, $GM_{\%}$). Similar figures are also computed and reported for trend real per capita income and financial development (x, f; $x_{\%}$, $f_{\%}$).

As shown in Table 3, on average across EA countries, during the period 2008-2013, GM (GN) increased 2.3% (1%); the corresponding figures for x and f are -3.8% and -9.7%, respectively. The response of income and inequality to changes in financial depth is then inelastic: a 1% reduction in the financial development indicator is associated with a -0.4% contraction in real per capita income and a 0.24% (0.1%) increase in the market (net) income Gini Index.

However, the evidence at the country level is scattered, also consistent with the strong national component in income distribution (see Gianetti, 2002; Bottazzi and Peri, 2003). In general, market (net) income inequality has increased across countries, apart from Italy, Latvia and Lithuania, the Netherlands, Portugal (Belgium, Germany, Luxemburg). In order to gauge further insights on the effects of the crisis, in Figure 5 we report cross-plots for the average market and net income Gini Index, relative to average real per capita income and financial development.

As shown in Figure 5, these two latter variables are non-linearly linked to income inequality. In particular, both GN and GM monotonically fall as the level of real per capita income increases (column 1, top to bottom plots): hence, the financial crisis would not have undermined the validity of KC, established over the whole estimation sample. Moreover, a U-shaped linkage relates income inequality and financial development, as GM and GN both decrease as financial deepening raises up to a 90%-100% threshold value, to then increase once the threshold is passed (column 2); a kind of "*too-much finance*" phenomenon can then be noted, where the highest average Gini Index figures are actually shown by the countries which were affected the most by the sovereign debt crisis, i.e., Cyprus, Ireland, Portugal and Spain, as well as Greece and Italy, also showing financial deepening well in excess of the threshold.[11]

Comparison between net and market income inequality figures is then strongly informative on the effectiveness of redistributive policies and automatic stabilizers, particularly for the countries which were most severely hit by the sovereign debt crisis. Among the latter, Spain can be singled out as the EA member country where inequality has increased the most during the

[11] It is worth noticing that the estimated threshold values for financial development are very close to those obtained by Arcand et al. (2015) and Borio and Lowe (2004), using different data and econometric techniques.

crisis, also when the effects of redistributive policies are accounted for (11.3% and 7.3%, for $GM_{\%}$ and $GN_{\%}$, respectively); similarly Greece (6% and 4.3%, for $GM_{\%}$ and $GN_{\%}$, respectively) and Cyprus (2% and 1.9%, for $GM_{\%}$ and $GN_{\%}$). On the other hand, Italy, Portugal and Ireland are the countries where inequality has been affected the least or even decreased, due to redistributive policies (IT: -0.1% and -1.1%; PT: -0.9% and -3.6%; IE: 8.5% and -1.7%, for $GM_{\%}$ and $GN_{\%}$, respectively).

6.1 The Gini index anomaly

In Table 3 we also report figures for the *Gini Index anomaly* during the crisis period, computed as the average deviation of the actual Gini Index from its predicted value, according to the corresponding SS-FKC (GN_a, GW_a, GM_a). Hence, the Gini Index anomaly measures *excess inequality* generated by factors unrelated to economic and financial development trends, allowing for a counterfactual comparison of the effects of the crisis, relative to a non-crisis scenario. As shown in the Table, the anomaly is on average sizable, about 3.5% for GM_a, also when redistributive policies are taken into account (1.5% for GN_a).

In Figure 5 we relate the anomalies to the level of both economic and financial development (columns 3 and 4, respectively). An inverse-U shaped linkage can then be noted for excess inequality and real per capita income, reminiscent of the KC itself, as the anomaly raises until a per capita income threshold of about €25,000 is achieved, to fall thereafter. On the other hand, excess inequality monotonically increases with the level of financial development.

The two groups of relatively more and less advanced countries can then be singled out again, the former showing a positive anomaly falling with the level of economic development, yet increasing with financial deepening (6.3 for GM_a; 3.1 for GN_a); the latter showing a negative anomaly (-3.2% for GM_a; -2.1% for GN_a).

The crisis, through its recessionary impact, would have then exercised adverse effects for both groups of countries. In fact, a contraction in real per capita income, occurring along the upward (downward) sloped portion of the FKC, would cause a reduction (increase) in income inequality, therefore generating lower (higher) income inequality than predicted under a non-crisis scenario. Consistent with the "*too much finance*" phenomenon already detected, the positive anomaly is actually largest for the countries most severely hit by the sovereign debt crisis, i.e., Cyprus, Ireland, Portugal and Spain (on average 8.2% for GM_a and 3.6% for GN_a), yet not Greece and Italy (4.8% for GM_a and 0.9% for GN_a), which show financial deepening well in excess of the 90%-100% threshold. Income distribution would have then worsened not only for peripheral EA member countries, which were most severely hit by the financial crisis, but also for those showing much sounder public finances, i.e., Austria, Belgium, Finland, France, Germany and Luxemburg. For the latter countries, the anomaly is positive and large not only when assessed using GM_a (5.1% on average), but also once redistributive policies are taken into account (3.1% on average for GN_a).

7 Conclusions

The paper introduces a new specification of the Kuznets curve, where turning point per capita income is conditioned to the level of financial development. It then provides new evidence on real income convergence for the euro area since the mid-1980s, with a special focus on the subprime and sovereign debt financial crises.

We find strong evidence in favor of an EA-wide steady-state *financial Kuznets curve*, i.e., of a long-term inverse-U shaped linkage between inequality and income development, where financial deepening contributes to a more even distribution of income by lowering the per capita income level at which the turning point of the KC occurs. We hold the latter finding as evidence of ongoing convergence, across EA members, toward a common turning point per capita income level (about € 13,000).

Comparison of EA-wide and own member country FKCs, allows us to single out two groups of countries, composed of the most and the least advanced EA member states, showing turning point per capita income levels of about €10,000 and €16,000, respectively, and a financial development gap of about 23 GDP points. Through further financial deepening, a -20% reduction in turning point per capita income could be then attained by the most recent member countries, as well as a sizable contraction in income inequality (-4%).

While the financial crisis would not have undermined the validity of the EA steady-state FKC, it has however sizably increased income inequality for all EA member countries. In fact, a counterfactual analysis, comparing actual and predicted Gini Index figures, points to higher inequality than would otherwise have occurred in a non-crisis scenario also for those countries which were little affected by the sovereign debt crisis. A "*too much finance*" phenomenon is actually detected during the crisis, since inequality falls as financial deepening increases up to a threshold value of 90-100 GDP points, to then increase as the threshold is passed. Coherently, the countries that were affected the most by the sovereign debt crisis show the highest figures for both variables.

From a policy perspective, ensuring financial stability, i.e., financial market conditions where asset price fluctuations are dampened, is instrumental not only to foster stable economic growth, but also to achieve a more even distribution of income. In this respect, the stable macroeconomic environment prevailing since the mid-1980s in core EA, as well as in other OECD countries (the so called *Great Moderation*), was temporarily destabilized by the US subprime financial crisis and ensuing Great Recession in the late 2000s (Bagliano and Morana, 2015).

This is also the same context where the *Great Divide* phenomenon, i.e., the rise in income inequality ongoing since the mid-1980s in OECD countries, originated. In addition to the traditional explanations related to the effects of globalization, skill-biased technical change, unionization, problems with access to education and the decline in the progressivity of the tax schedule at the upper tail of the income distribution (OECD, 2011), the contribution of financial instability to this phenomenon should not be neglected, at least for the 2008-2013 period. Our findings then highlight the need to further correct those factors that made an otherwise stable macroeconomic environment unstable, i.e., excessive risk taking of financial intermediaries, boosted by financial deregulation and innovation and misled risk perceptions.

Financial stability should actually be counted as an additional, *financial pillar* to the economic, social and environmental pillars of the *Lisbon Strategy*, continued in the *Europe 2020 Strategy*, in the perspective of truly making Europe "the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth *and stable financial development*, with more and better jobs and greater social cohesion". The creation of a European Banking Union together with a unified banking supervision mechanism, as well as the most recent proposal for a Capital Markets Union, surely are important steps in this direction (European Commission 2014, 2015).

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Table 1: Stacked OLS (M.A.S.) estimation results for the linear and log-log model

	Liner model				Log-log model			
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
xg	-0.122**	-0.193***	-0.327***	-0.329***	-0.226***	-0.274***	-0.269***	-0.254***
	(0.054)	(0.065)	(0.105)	(0.092)	(0.039)	(0.042)	(0.044)	(0.042)
g	-0.001	-0.022	-0.114	-0.220***	-0.054	-0.070	-0.057	-0.106
	(0.056)	(0.060)	(0.086)	(0.084)	(0.051)	(0.052)	(0.073)	(0.084)
fg	-0.395***	-0.327***	-0.298***	-0.337***	-0.289***	-0.243***	-0.244***	-0.252***
	(0.080)	(0.098)	(0.102)	(0.097)	(0.066)	(0.070)	(0.071)	(0.069)
DEP	0.648***	0.546***	0.573***	0.576***	0.620***	0.501***	0.499***	0.492***
	(0.054)	(0.050)	(0.056)	(0.056)	(0.054)	(0.045)	(0.047)	(0.050)
PE	-0.526***	-0.540***	-0.571***	-0.533***	-0.444***	-0.460***	-0.457***	-0.439***
	(0.074)	(0.071)	(0.068)	(0.065)	(0.066)	(0.061)	(0.059)	(0.061)
SPREAD	-	-0.214***	-0.233***	-0.337***	-	-0.237***	-0.236***	-0.289***
		(0.063)	(0.062)	(0.074)		(0.058)	(0.058)	(0.073)
TRADE	-	-	0.179*	0.309***	-	-	-0.019	0.022
			(0.106)	(0.100)			(0.070)	(0.077)
URBAN	-	-	-	-0.233***	-	-	-	-0.102
				(0.071)				(0.072)
R-squared	0.560	0.592	0.600	0.626	0.593	0.634	0.634	0.639
Adj. R-squared	0.546	0.577	0.583	0.608	0.580	0.620	0.618	0.621
Hetero	4.634 [0.000]	7.896 [0.000]	7.525 [0.000]	7.365 [0.000]	4.605 [0.000]	8.182 [0.000]	8.000 [0.000]	12.219 [0.000]
Reset2	1.870 [0.173]	12.040 [0.000]	8.350 [0.004]	11.750 [0.000]	1.020 [0.315]	0.010 [0.918]	0.000 [0.962]	0.010 [0.916]
Reset23	11.970 [0.000]	9.710 [0.000]	8.390 [0.000]	7.870 [0.000]	9.120 [0.000]	7.520 [0.000]	8.740 [0.000]	7.010 [0.001]
Normality	0.062 [0.960]	3.080 [0.214]	3.641 [0.162]	5.269 [0.072]	0.977 [0.610]	2.725 [0.256]	2.179 [0.336]	2.537 [0.281]
Obs	171	171	171	171	171	171	171	171

The Table reports the results of stacked OLS estimation for the linear and log-log models (columns 1-4 and 5-8, respectively), with robust standard errors in round brackets. Income inequality is measured by the stacked market (*GM*) and net (*GN* and *GW*) income Gini Index, while financial development *f* by the stacked GDP shares of credit to the private sector (*c*), liquid liabilities (*m*) and stock market capitalization (*s*). The other (stacked) regressors are: *xg*, the product of trend real per capita income at mid sample (year-2000) value (*x*) and its average rate of growth over the 1985-2013 period (*g*); *fg*, the product of the trend financial development index at mid-sample value (*f*) and the trend per capita income average rate of growth (*g*); the average age dependency ratio (*DEP*), government spending (*PE*), population share living in urban area (*URB*), trade openness index (*TRADE*), 10-year Treasury bond rate spread relative to the German T-Bund rate (*SPREAD*). *R-squared* and *Adj. R-squared* are the unadjusted and adjusted coefficient of determination; Hetero is the White test for heteroscedasticity; Reset2 and Reset23 are the Ramsey-Reset functional form tests using squares and squares and cubes of fitted values, respectively; Normality is the Bera-Jarque Normality test; P-values are reported in square brackets. The symbols *, **, *** denotes significance at 10, 5 and 1 per cent level, respectively. The number of observations is denoted by Obs.

Table 2: EA-wide and EA own-country steady-state financial Kuznets curve: turning point real per capita income, inequality and reference level for financial development

	Panel A: EA-wide				
	$\hat{x}^*$	$\hat{y}^*_{GN}$	$\hat{y}^*_{GW}$	$\hat{y}^*_{GM}$	$\hat{f}^*$
EURO AREA	13,279	31.024	32.215	48.498	82.15
	(1,207)	(0.446)	(2.005)	(0.434)	
	Panel B: DEV and UDV EA countries				
	$\hat{x}^*$	$\hat{y}^*_{GN}$	$\hat{y}^*_{GW}$	$\hat{y}^*_{GM}$	$\hat{f}^*$
DEV	12,156	32.450	34.346	53.351	91.573
ex – NL	9,991	33.011	34.921	54.055	95.471
UDV	21,140	35.205	34.378	55.557	65.989
ex – LT	16,236	33.418	32.515	53.338	72.285

Panel A in the Table reports the EA-wide financial Kuznets curve turning point per capita income ($\hat{x}^*$), Gini Index income inequality ($\hat{y}^*_i$; i = *GN*, *GW*, *GM*), and reference level for financial development ($\hat{f}^*$). Estimates are from the selected OLS log-log model. In Panel B the same statistics are reported for the two groups of more (*DEV*) and less (*UDV*) financially developed EA countries, also omitting, for robustness, the outlying countries, i.e., the Netherlands and Lithuania. DEV: Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxemburg, Portugal, Spain, the Netherlands; UDV: Cyprus, Estonia, Latvia, Lithuania, Malta, Slovakia and Slovenia.

Table 3: Real per capita income, financial development and Gini Index anomaly and actual values: 2008-2013

Panel A: EA member country figures

	Real per capita income		Financial development		Actual Gini Index						Gini Index Anomaly		
	x	$x_{\%}$	f	$f_{\%}$	GN	$GN_{\%}$	GW	$GW_{\%}$	GM	$GM_{\%}$	GN_a	GW_a	GM_a
Austria	32,761	0.3	103.62	-9.89	27.66	2.85	26.48	1.08	46.34	0.97	2.688	2.38	5.756
Belgium	30,389	-1.83	110.79	-13.96	25.47	-1.19	26.7	1.5	44.57	3.41	2.33	1.826	1.921
Finland	32,192	-5.37	90.05	-2.37	26.18	-0.83	25.78	-1.59	47.57	1.64	5.695	4.67	6.943
France	28,550	-1.58	103.26	-6.7	29.45	5.78	30.18	13.47	49.49	2	2.191	2.977	1.912
Germany	30,475	1.87	99.07	-4.63	28.64	-0.57	29.12	-4.22	50.87	0.35	2.678	4.081	6.706
Greece	16,901	-13.53	106.03	-7.76	33.18	4.34	33.62	-1.98	50.79	6.03	0.79	0.558	5.413
Ireland	38,305	-9.99	143.09	-18.99	29.21	-1.65	29.83	-4.69	54.15	8.52	-0.624	-0.019	7.288
Italy	24,617	-6.75	101.98	-5.1	32.67	-1.05	31.9	2.9	48.84	-0.05	1.166	0.994	4.097
Luxembourg	65,231	-5.81	121.04	-23.87	27.04	-2.04	27.92	1.89	46.15	0.55	2.861	1.979	7.461
Spain	20,973	-5.71	139.16	-3.44	32.83	7.29	33.75	5.8	49.97	11.3	3.779	5.71	9.354
Portugal	15,160	-3.21	127.72	-6.48	34	-3.57	34.72	-5.64	56.08	-0.92	4.211	-0.44	8.031
Netherlands	35,204	-1.4	51.49	-15.29	25.75	-6.01	26.14	-5.28	45.52	-1.9	-0.545	-2.197	-0.274
Slovakia	11,891	5.83	78.91	-33.04	26.17	5.53	25.34	3.41	42.82	2.94	-0.602	-1.571	-2.804
Slovenia	15,599	-4.67	109.1	-11.54	24.77	7.68	23.7	2.14	41.14	3.9	5.333	2.835	9.229
Estonia	9,033	-9.72	81.03	-7.13	32.35	1.59	31.72	-5.02	48.87	5.49	-3.535	-3.521	-3.054
Latvia	3,554	-10.03	78.18	29.11	35.49	-2.41	36.15	2.12	56.7	-2.89	-3.201	-1.658	-5.355
Cyprus	15,467	-4.4	138.13	-11.66	29.98	1.91	29.27	-1.79	48.83	2.03	7.15	5.577	8.228
Malta	13,089	3.66	73.03	-11.28	27.39	0.92	27.62	5.01	44.98	0.9	-1.285	-1.424	-2.14
Lithuania	7,102	0.49	40.55	-19.47	34.65	-0.8	34.33	-1.9	54.83	-0.86	-2.099	-3.616	-2.482

Panel B: Average figures

	Real per capita income		Financial development		Actual Gini Index						Gini Index Anomaly		
	x	$x_{\%}$	f	$f_{\%}$	GN	$GN_{\%}$	GW	$GW_{\%}$	GM	$GM_{\%}$	GN_a	GW_a	GM_a
Average EA	**23,500**	**-3.782**	**99.802**	**-9.657**	**29.625**	**0.935**	**29.698**	**0.379**	**48.869**	**2.285**	**1.525**	**1.008**	**3.486**
DSFKC	**28,201**	**-4.668**	**114.849**	**-9.722**	**29.314**	**1.458**	**29.459**	**0.682**	**48.83**	**3.056**	**3.096**	**2.548**	**6.334**
USFKC	**8,934**	**-1.954**	**70.34**	**-8.362**	**31.21**	**0.966**	**31.032**	**0.724**	**49.64**	**1.116**	**-2.144**	**-2.358**	**-3.167**

Panel A reports average figures for EA member countries *Gini Index anomaly* (GN_a, GW_a, GM_a) and *actual values*, in levels (GN, GW, GM) and rate of growth ($GN_{\%}$, $GW_{\%}$, $GM_{\%}$), over the period 2008-2013. Average figures for trend per capita income and financial development levels (x, f) and rates of growth ($x_{\%}$, $f_{\%}$) are also included. Panel B reports EA-wide average figures and for the two groups with downward (DSFKC) and upward (USFKC) sloped financial Kuznets curves, respectively. DSFKC: Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxemburg, Spain, Portugal, as well as Cyprus and Slovenia; USFKC: Estonia, Latvia, Lithuania, Malta, Slovakia. The outlying figures for the Netherlands are neglected in the computations for USFKC.

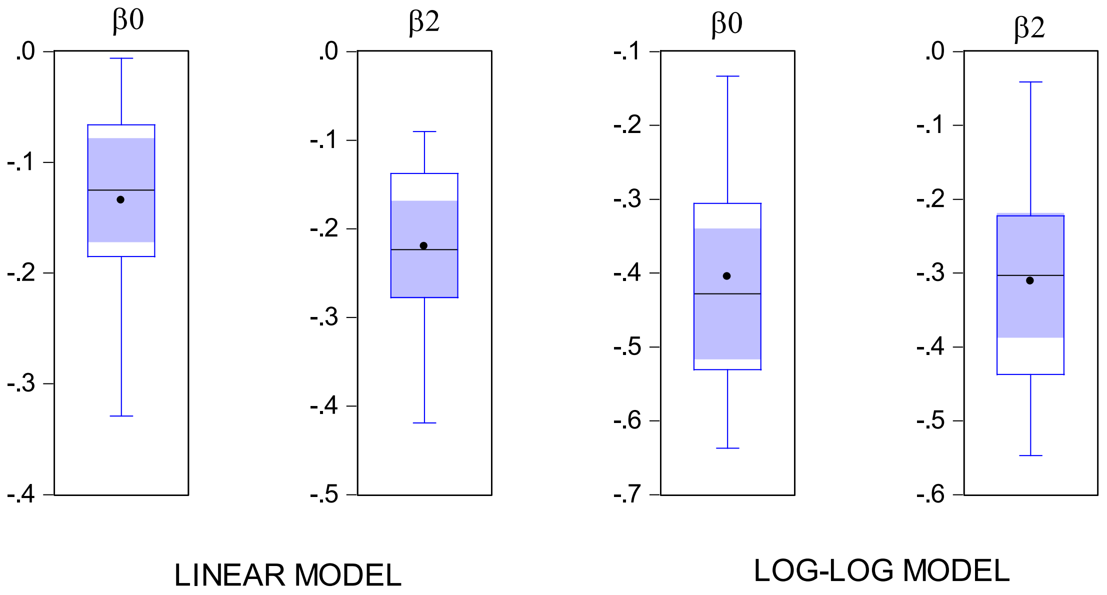

Figure 1: In the Figure box-plots for the estimated β_0 and β_2 parameters from the linear and log-log cross-sectional regressions are reported. The box portion represents the first and third quartiles, while the median is depicted using a line through the center of the box and the mean is drawn using the dot. The difference between the first and third quartiles represents the *interquartile range*, or IQR. The shaded areas refer to the 95% confidence interval about the median, while the outer lines represent the last data point within (or equal to) each of the inner fences, defined as the first quartile minus 1.5*IQR and the third quartile plus 1.5*IQR.

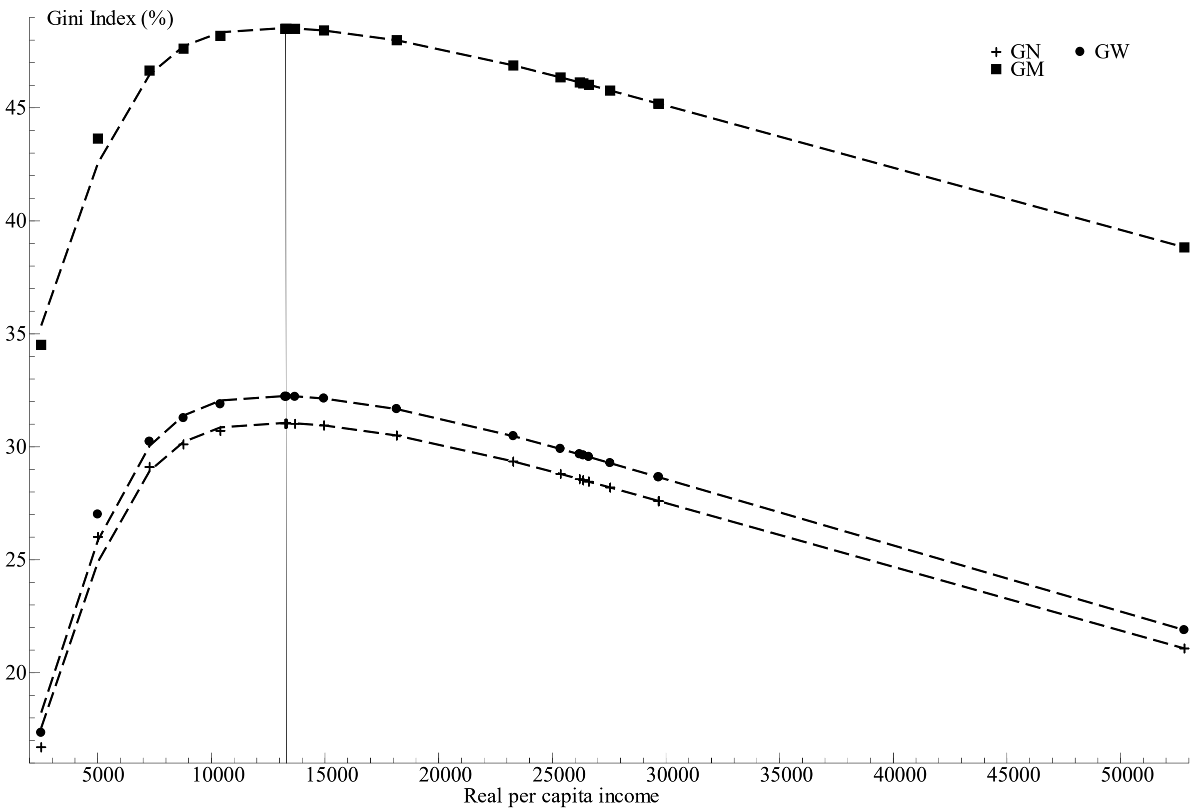

Figure 2: In the plot the estimated EA steady-state financial Kuznets curve (cubic spline interpolation), obtained by means of the preferred OLS log-log model, is plotted with reference to the available three measures of income inequality, i.e., the net (GN) and market (GM) income Gini Index (%).

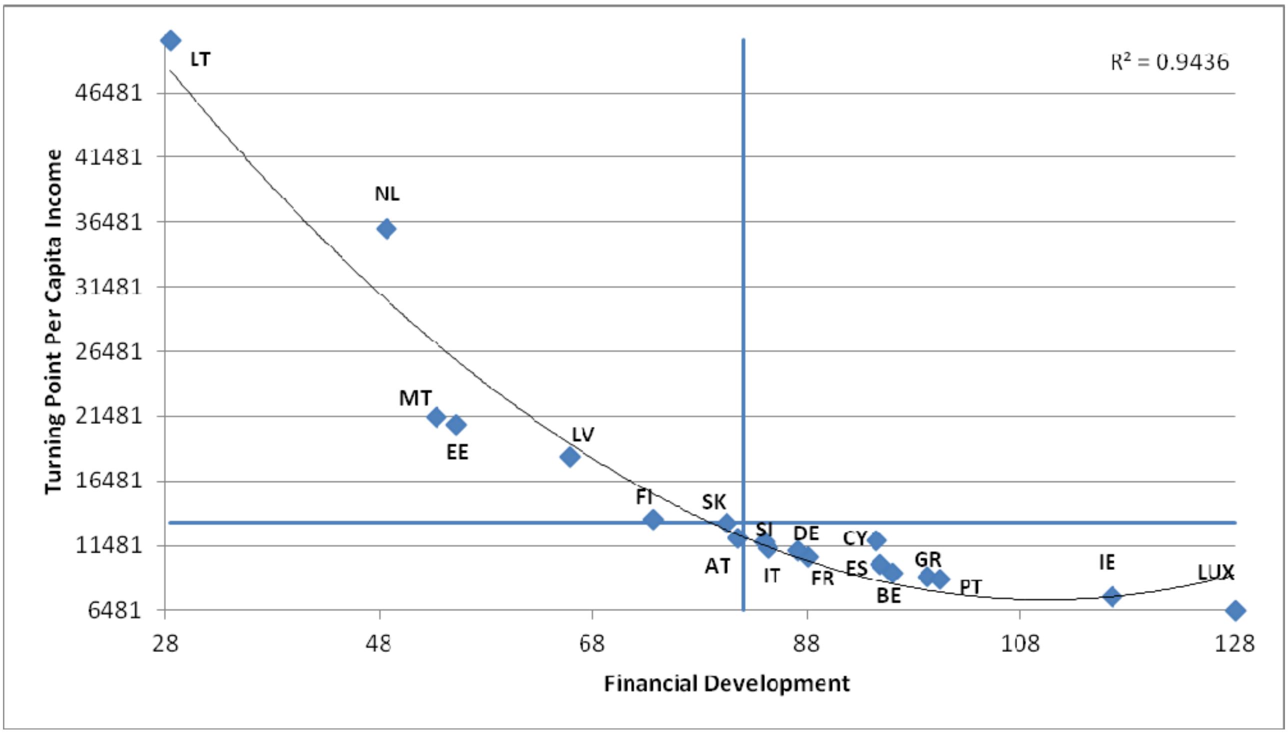

Figure 3: The plot shows the relationship between the EA member countries FKC turning point per capita income (x^*) and the overall level of financial development (*f*). The straight lines are reported in correspondence of the estimated values for the EA steady-state Kuznets curve. In all cases OLS log-log model estimates are reported.

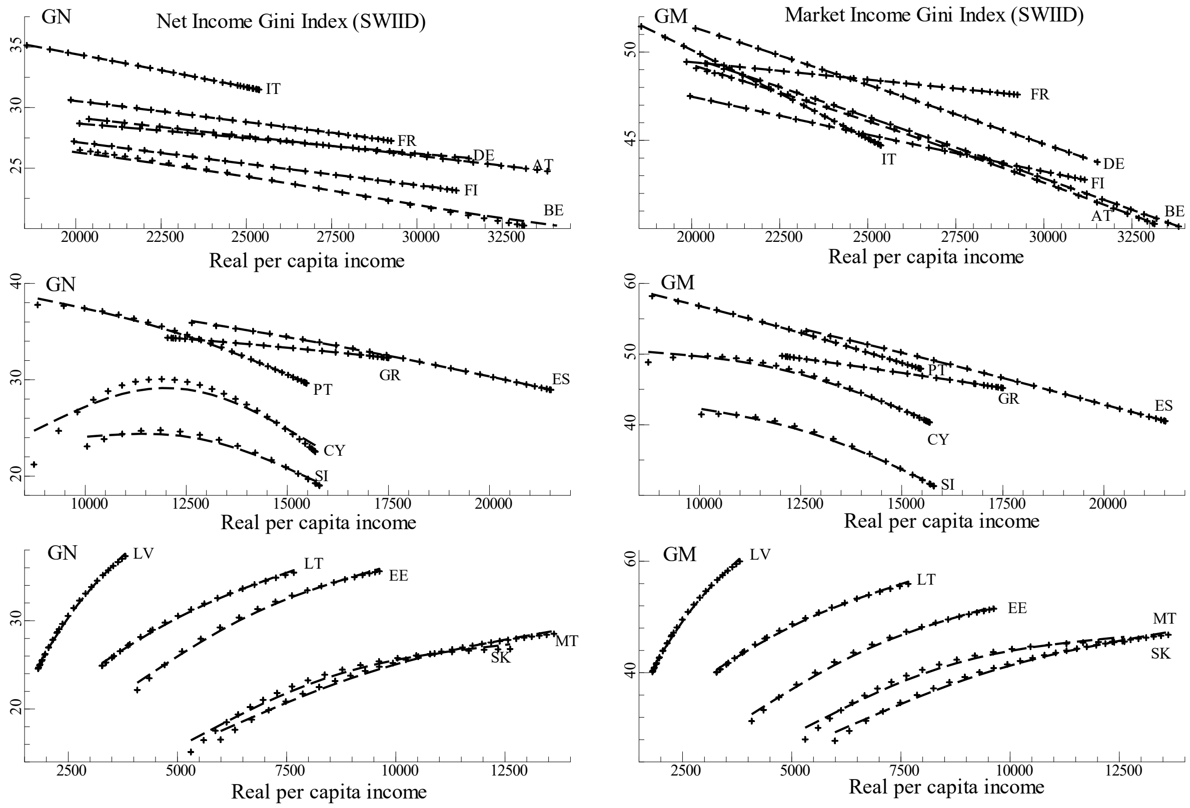

Figure 4: In the plot the estimated financial Kuznets curve for the various EA countries, obtained by means of the preferred OLS log-log model, are plotted with reference to the net (GN) and market (GM) income Gini Index (%). Figures for Ireland, the Netherlands and Luxemburg are not reported for graphical convenience.

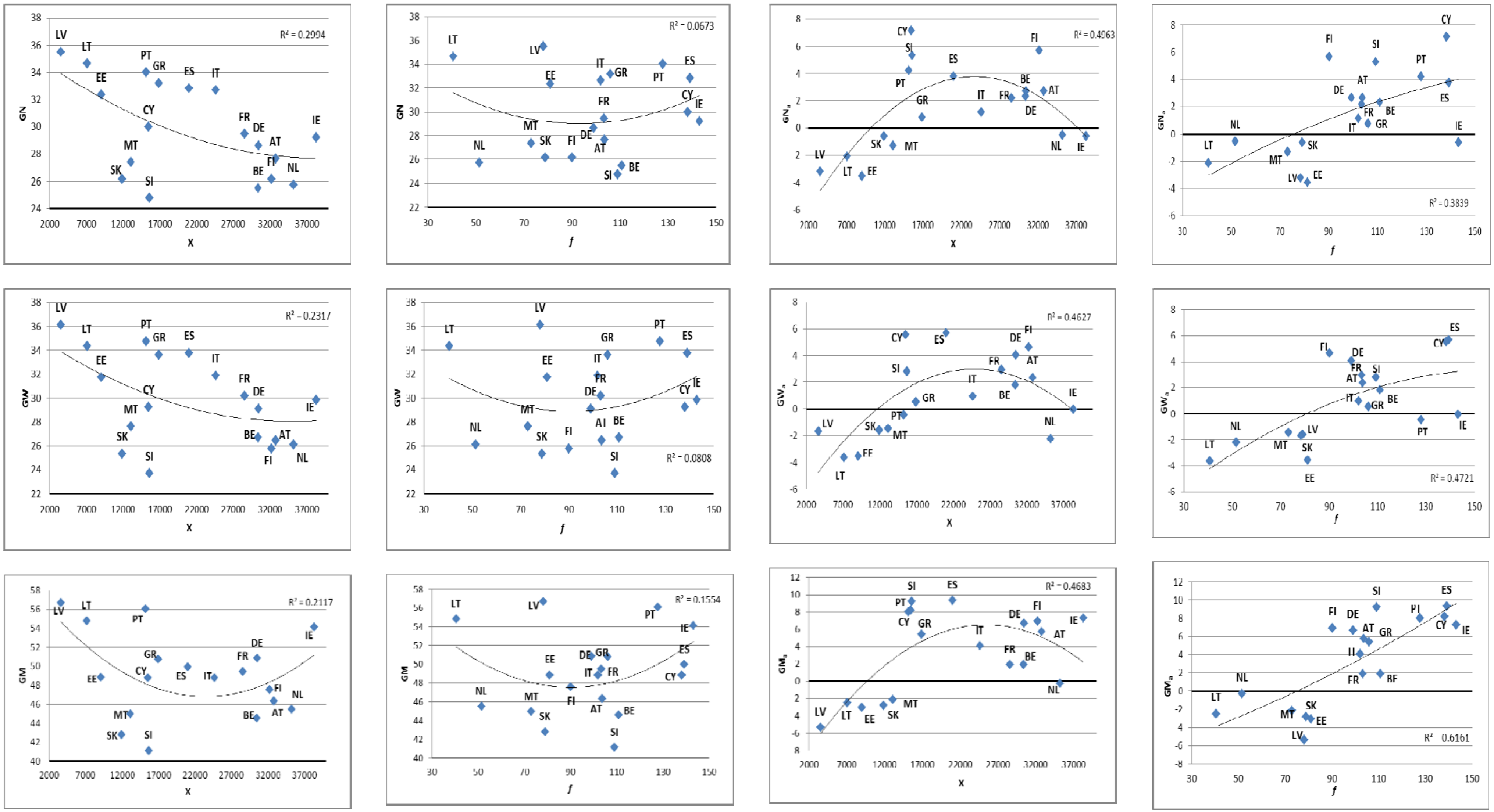

Figure 5: Gini Index levels (*GN*, *GW*, *GM*) and corresponding anomaly values (GN_a, GW_a, GM_a) versus real per capita income (*x*) and financial development (*f*). Figures for Luxemburg are omitted for graphical convenience.