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Abstract

The paper considers whether structural reforms have a different impact on adjusted household disposable income (AHDI) compared to GDP, particularly given that while the latter is currently used as the basis for the OECD Economics Department's framework for evaluating the effect of structural policy reforms, the former is arguably a better measure of welfare. The main findings are that there are indeed a number of structural policies where the long-run effects on GDP and AHDI are proportionately different, so that percentage changes in the two aggregates are significantly different following a policy reform. One group of structural policies, typically those where the transmission mechanism depends mainly on productivity and capital intensity (including cuts in corporate income tax and policies to simulate business R&D) or which can weaken the bargaining power of labour (for example a loosening of EPL), have weaker long-run positive effects on AHDI than GDP. Other structural reform policies (including in-kind family benefits, family cash benefits and cuts in the income tax wedge) have a magnified effect on AHDI, so that following a policy reform, long-run percentage changes in AHDI are larger than for GDP. Cross-referencing the analysis in the paper with structural reform priorities previously identified in the OECD's regular *Going for Growth* surveillance exercise, suggests that increased spending on childcare and early childhood education might usefully be part of any policy package to address the 'cost of living crisis' currently being faced by many OECD households.

JEL-Codes: D240, E170, E240, E250, J080.

Keywords: household disposable income, structural reforms, childcare, early childhood education, in-kind family benefits, tax wedge, employment, productivity.

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1. Introduction

The recent pick-up in inflation, exacerbated by sharp rises in energy and food prices, is leading to widespread falls in real household disposable income, which in some OECD countries is severe enough to have precipitated a 'cost-of-living crisis'. Sharp divergences between the growth rates of household disposable income and GDP serve as reminder that GDP -- often the obsessive focus of macroeconomists and economic forecasters -- is not the only national accounts measure of income that matters.[2] Moreover, there has long been an argument that household disposable income provides a superior measure of welfare to GDP and hence may be a better objective for policy.

The shortcomings of GDP as a measure of welfare have long been recognised, notably in a memorable speech by Robert Kennedy in 1968.[3] An alternative metric that has received increased attention more recently, which has the merit of being grounded in national accounts, is adjusted household disposable income (AHDI). This is used as an alternative measure to GDP in the OECD flagship publication "*How's Life: Measuring Well-being*", is a component of the *OECD Better Life Index*[4] and is broadly consistent with the recommendations of the Stiglitz-Sen-Fitoussi Commission on *Measuring Economic Performance and Social Progress* to focus on household income and consumption rather than output (Stiglitz et al, 2009).

The merits of adjusted household disposable income as a measure of welfare begs the question as to whether the effectiveness of different policies might also be better evaluated using such an objective, rather than GDP, and how much difference using such a metric might make. This is of particular relevance to the OECD Economics Department's framework for evaluating the effect of structural policy reforms (Égert and Gal, 2017), where policy effects are ultimately computed in terms of their effect on GDP per capita, although these estimates are first evaluated through their separate effects on employment, capital and total productivity and so have the advantage of more clearly identifying the channels through which policy is transmitted. The work reported here investigates how much difference using adjusted household disposable income as the metric for evaluating structural reforms might make as an extension to this framework.

The remainder of the study is organised as follows. The next section explains the different data concepts, which are at the core of the work. Section 3 discusses the related literature. Section 4 considers how relative country performance can differ according to whether it is assessed on the basis of AHDI or GDP per capita. Section 5 describes the estimation and modelling framework. Section 6 presents new estimation results examining the differential effect of structural reforms on adjusted household disposable income as against GDP. Section 7 considers the relevance of the analysis in the context of policies to address the current cost of living crisis in many OECD countries. Section 7 finally concludes.

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[2] In the latest forecasts published by the OECD (2022), the differential between the growth rate of real household disposable income and GDP is, unusually, negative for practically every OECD country in both 2021 and 2022, and the magnitude of this differential in many countries is either unprecedented or has not been experienced since the 1970s.

[3] Speech at the University of Kansas, March 18, 1968. Kennedy argued that GDP "*measures neither our wit nor our courage, neither our wisdom nor our learning, neither our compassion nor our devotion to our country*", concluding that "*It measures everything in short, except that which makes life worthwhile*."

[4] The OECD Better Life Index is designed to compare some of the key factors – like education, housing environment, and so on – that contribute to well-being in OECD countries. For the income component of the index, adjusted household disposable income per capita is used in preference to GDP per capita. For further details see: https://www.oecdbetterlifeindex.org/about/better-life-initiative/.

2. Definitions and data on adjusted household disposable income

A standard national accounts-based measure of household disposable income is the mean adjusted disposable income per capita. It is the sum of all the income flows, both primary (market) incomes (earnings, self-employment and capital income) and secondary (redistributed) incomes (current transfers received from the government sector) paid to the household sector and subtracting current transfers (taxes on income and wealth) paid by households to other sectors of the economy. The adjustment in the title of the measure refers to social transfers in kind provided by the general government, i.e. the imputed value of central and local government services such as education, healthcare or housing (OECD, 2020). From another perspective, household disposable income (before adjustment for in-kind transfers) is equal to the sum of household final consumption expenditure and household saving (OECD, 2015). The indicator can be expressed in both net and gross terms, the difference being households' consumption of fixed capital (OECD, 2016b).

Two possible measures of mean adjusted household disposable income (AHDI) can be used:

- A measure based on gross household adjusted disposable income (Item B7G in SNA) for both the household sector (S14) and non-profit institutions serving households (NPISH) sector (S15), sourced from System of National Accounts (SNA) data.
- A measure based on net household disposable income (i.e. excluding consumption of fixed capital), sourced from SNA, national sources, Quarterly National Accounts and Quarterly Sector Accounts. Final consumption expenditure of general government (P31S13) and final consumption expenditure of NPISH (P31S15) are added on to this measure as a proxy for in-kind transfers received by households.

The resulting AHDI measures are deflated to get real values with price indices rebased to a common year (2017): the gross measure is deflated by the Actual Individual Consumption Implicit Deflator (P41 deflator in SNA); the net measure is deflated by Private Final Consumption Expenditure Deflator. The price indices used are another possible source of difference between real AHDI and real GDP, as output is deflated using the GDP deflator[5]. The real AHDI indicators, as well as real GDP are then expressed in per capita terms by dividing by total population. To be able to compare the indicators across countries and time, they are converted to a common currency using constant (2017) purchasing power parity US dollar.

The preferred measure in the current study is the one based on gross AHDI, as it is sourced directly from SNA and has a slightly broader data coverage. In addition, it is more comparable with GDP, which is also a gross concept. It is, however, noteworthy that the gross and net AHDI measures are highly correlated (with a correlation coefficient of over 99%), the difference being mainly a level shift (net AHDI is lower, as it accounts for consumption of fixed capital).

There are various possible sources of differences between GDP and AHDI measures. First, AHDI is comprised of incomes that may flow to its resident households originating from outside the borders of a country and are hence not part of GDP (e.g. wages and salaries, or interest and dividends from abroad). Second, part of incomes generated within the borders of a country (GDP) may flow to households, corporations or other entities resident abroad (e.g. repatriated profits of foreign-owned enterprises). Third, one could potentially argue that over the long run, all output gains accrue to households, as they are the ultimate holders of capital stock. However, over the short- to medium-term, items like saving/borrowing, corporate savings or re-invested profits may drive a wedge between incomes accruing to households and

[5] A comparison of growth rates of the two deflators and of nominal vs real values of GDP and AHDI over 1995-2019 indeed suggests that the different deflators and their evolution contributed to the gap between GDP and AHDI over this period. The extent and sign of this contribution to divergence between GDP and AHDI varies across countries. OECD (2016b) show that this was also the case for OECD countries for the period 1995-2013.

other sectors. Finally, in real terms, the different deflators used and their underlying drivers, such as the terms of trade, may also play a role (Causa et al., 2014, OECD, 2016b).

3. Related literature

Past work on household disposable income (HDI) focused on inequality, investigating the differing impact of policies along the income distribution. Causa et al. (2015) and Causa et al. (2016) analysed the impact of a broad set of structural policies. Fournier and Johansson (2016) investigated the size and mix of public spending on HDI. Akgun et al. (2017) considered the effects of the tax mix on the distribution of HDI.

The HDI variable used in these studies was based on an aggregated household-level HDI, cash-based and hence not adjusted for some non-cash components, such as in-kind public transfers including education and health care services. The measure is equivalised, so that it refers to a unit of consumption, namely the household, as opposed to the per capita measure used in this paper. The source of this data is the OECD Income Distribution Database.

The studies share a common framework in which policies affect HDI directly, via an estimated relationship between HDI as a dependent variable, and policies, GDP and other control variables as explanatory variables. Notably, the regressions control for net exports, terms of trade or other variable capturing openness, to account for the fact that mean HDI elasticity to GDP is more likely to deviate from unity in more open economies under persistent external imbalances whereby households tend to consume more or less than their income. In addition, the difference may be driven by differences in growth of output and consumer prices that, in turn, can to a certain extent result from terms-of-trade effects (Causa et al., 2014, 2016).

In this framework, policies also have an impact on HDI indirectly, via a GDP-related term present as a control variable. The indirect impact via output can either take place through GDP itself, or through one or more of its components (e.g. labour productivity, employment). The size of the elasticities on GDP (or its supply-side components) with respect to policies is either taken from existing work, notably from Égert and Gal (2017), or estimated in another regression with GDP as a dependent variable. The elasticity of HDI with respect to GDP (or its component) is either assumed to be unity (Fournier and Johansson, 2016) or estimated freely. The estimated GDP elasticities could either exceed unity (Causa et al., 2016), or be inferior to unity (Causa et al., 2015) at mean income. Due to limited degrees of freedom in the income distribution data, policies enter the direct relationship one-by-one (Causa et al., 2016) or in small groups of related policies (Akgun et al., 2017).

The direct effects of polices on HDI at mean or median income were found to be mostly not statistically significant for a wide range of policies in these studies, so that policies affect mean household incomes only indirectly, via GDP or its supply-side components including for instance labour productivity and labour utilisation. Statistically and economically significant direct effects were mostly found towards the tails of the income distribution (at low or high incomes). Direct negative effects at mean or median income were found for total underlying primary spending ratio to potential GDP, environmental taxes as a share of GDP, while positive effects were found for a constructed measure of the use of top marginal rate of personal income tax and recurrent taxes on net wealth as a share of GDP (Akgun et al., 2017). Causa et al. (2015) reported positive direct effects at mean income of minimum wages, spending on active labour market policies (employment services and administration), and the share of direct taxes and corporate income tax in total tax revenue; they found a negative impact of unemployment benefits replacement rate, share of consumption and property taxes in tax revenues and product market regulation (the latter result implying greater competition in product markets improves income at the mean). No direct effects at mean income were identified for the average labour tax wedge (Akgun et al., 2017; Causa et al., 2016), for family benefits in kind (Fournier and Johansson, 2016; Causa et al., 2016), spending on R&D (Causa et al., 2016) or other measures of technological progress, e.g. ICT investment share (Causa et al., 2015).

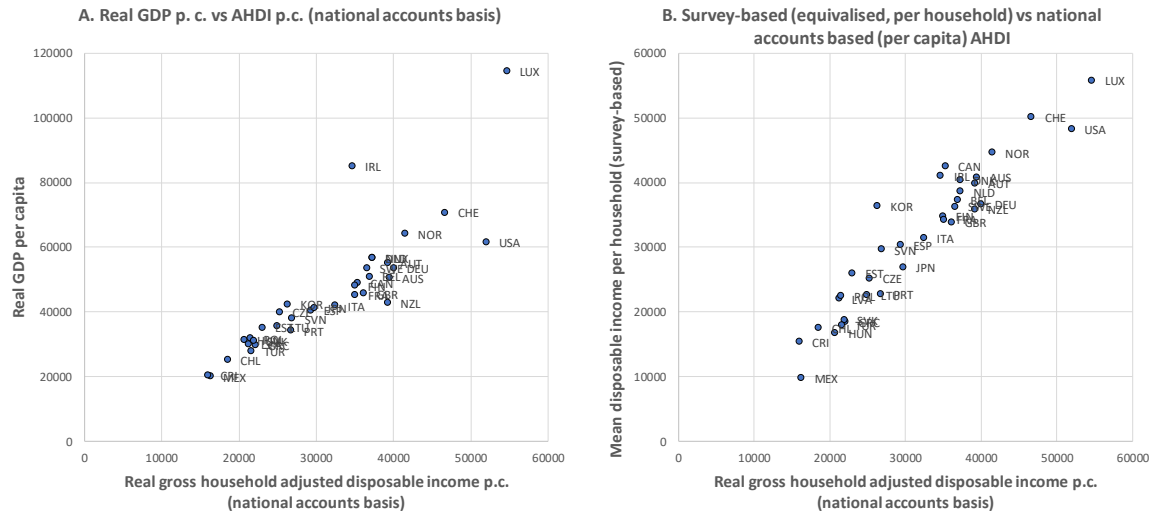
The empirical work in the main part of this paper builds on the literature described above, but also differs in important ways. In contrast to Causa et al. (2015, 2016), the joint effects of policies on AHDI are estimated simultaneously, rather than adding them separately to regressions. A second difference is that the current empirical work uses AHDI per capita and is based on national accounts data, rather than the survey-based HDI per household. Finally, this document provides aggregate policy effects at the national level and does not look into how policies affects HDI over the income distribution. Average effects on AHDI facilitate a more direct comparison with the effects of policies on GDP per capita.

4. Comparisons of adjusted household disposable income and GDP

Data on gross AHDI is available for up to 34 OECD countries, mostly covering the period of 1995-2019.[6] As is to be expected, gross AHDI per capita is closely correlated both with GDP per capita, as well as with the survey-based mean AHDI per equivalised household for a recent snapshot year (Figure 1). For all countries, gross AHDI per capita is lower than GDP per capita, making up about two thirds of GDP for an average OECD country (see Figure 2 for a recent snapshot year). The difference tends to be bigger for countries with larger external sectors like Ireland or Luxembourg and it is the lowest for New Zealand and the United States.

Figure 1. Comparisons of GDP and different measures of household disposable income

2018 or latest available data



Note: Mean household disposable income per household is equivalised to account for different household sizes and has been deflated using Private Final Consumption Expenditure Deflator converted to constant 2017 Purchasing Power Parity standards, to facilitate comparison across countries and measures.
Source: OECD Income Distribution Database, OECD Spider Database, OECD National Accounts Database and authors' calculations.

A comparison of the rankings for a recent snapshot year confirms that the relative standings of OECD countries for the two variables are highly correlated (Figure 2). However, in some cases the use of ADHI

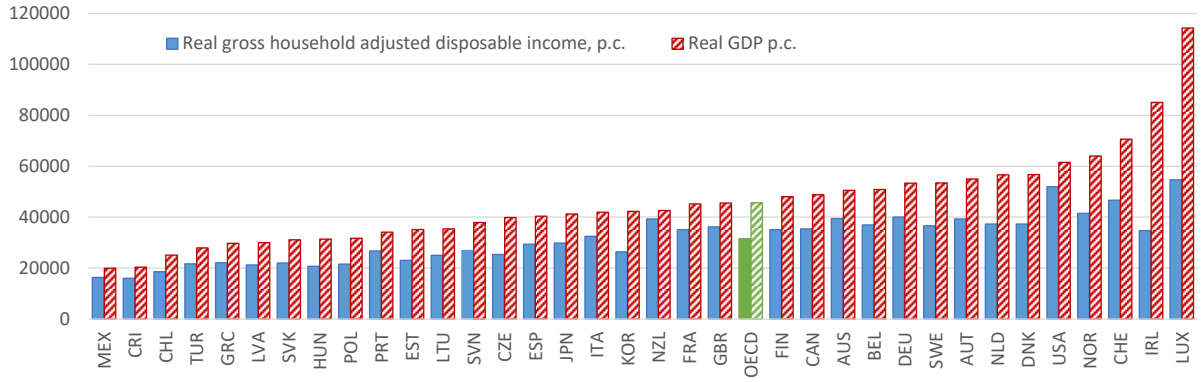
[6] A few countries have data available for 2020, while for a few others the coverage ends earlier than in 2019. For some countries, coverage starts later than in 1995. Chile, Costa Rica and Turkey have data available for less than ten years; there is no gross AHDI data available for Colombia.

as an alternative to GDP per capita, can lead to striking shifts in a country's performance relative to other OECD countries (OECD, 2016a; Deaton, 2020), examples of which include:

- Ireland ranks among the top three OECD countries in terms of GDP per capita, but it is close to the median in terms of AHDI;
- the United States is ranked second based on AHDI and is only 5% behind the leading country, rather than fifth and 46% behind the leading country based on GDP per capita;
- Luxembourg retains its top ranking under both measures, but the difference with other OECD countries varies substantially between the two metrics: Luxembourg has 2.7 times the GDP per capita of the OECD median country, but only 1.7 times the AHDI of the OECD median country.

Figure 2. Real gross household adjusted disposable income and real GDP levels in 2018

Per capita, in constant 2017 PPP USD

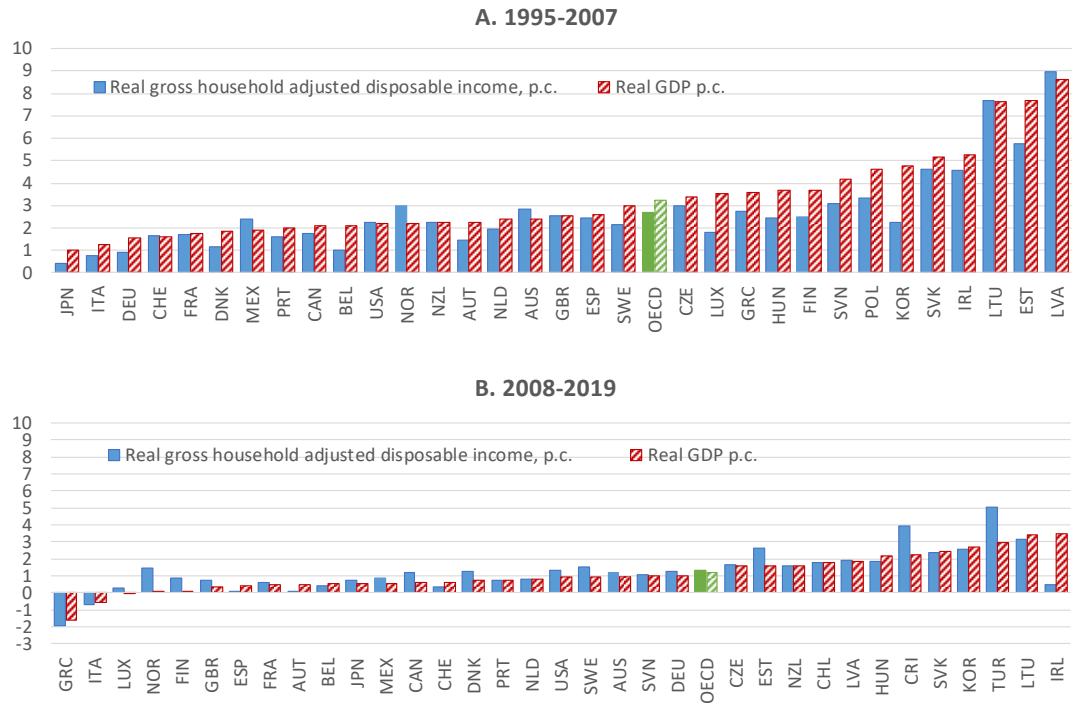


Note: OECD average is unweighted. Values for Costa Rica, Japan, New Zealand and Turkey are from 2017 (2018 values not available).
Source: OECD Spider Database, OECD National Accounts Database and authors' calculations.

In terms of growth rates, both AHDI and GDP per capita were growing faster before the 2007-08 Global Financial Crisis (GFC) on average, and in most OECD countries, GDP outpaced AHDI (Figure 3). After the GFC, the average (unweighted) growth rate of both variables slowed down considerably and the difference between them narrowed. In more than half of the OECD countries in this period, AHDI grew at a similar rate or even faster than output.

Figure 3. Growth rates of real gross household adjusted disposable income and GDP

Average annual growth rates of per capita variables in local currency units



Note: OECD average is unweighted. Averages are based on available data within the respective period.
Source: Authors' calculations based on the OECD SPIDER Database and the OECD National Accounts Database.

5. The estimation and modelling framework

The current approach to modelling the effect of policies on household disposable income should be seen in the context of previous OECD work on the subject, although the current approach is better suited to a comparison with the OECD Economics Department's existing framework for evaluating the effect of structural policy reforms (Box 1).

The estimated long-run specification explains logged AHDI in terms of logged GDP (both expressed in per capita terms), a set of *n* policy instruments (X_i, i = 1,…., n) and two control variables, namely a measure of the output gap, GAP (to capture cyclical effects), and a measure of the real price of energy faced by industry and households[7]:

$$ln(AHDI) = \alpha + \beta\, ln(GDP) + \sum_{i=1}^{n} \gamma_i X_i + \theta_1 GAP + \theta_2 \ln(Real\ Energy\ Price) \qquad (1)$$

The equation is estimated for an unbalanced panel of 27 OECD countries on annual data with the maximum sample period covering the years 1995- 2017. It is estimated using the Dynamic OLS (DOLS) estimator proposed by Stock and Watson (1993), which accounts for possible endogeneity and serial correlation in the residuals

[7] Real energy prices are defined in terms of end use total energy prices for industry and households from the International Energy Agency's Energy Prices and Taxes Statistics, which are then deflated by the GDP deflator.

Two distinct variants of equation (1) are estimated: a restricted version (1A) in which a long-run unit elasticity between changes in GDP and AHDI is imposed (i.e. β=1 is imposed, so effectively the dependent variable in estimation is the logged difference between AHDI and GDP); and an unrestricted version (1B) in which the coefficient on logged GDP, β, is freely estimated. While imposing a unit elasticity has some intuitive appeal over the long run, previous OECD work suggests that this elasticity, when estimated over recent historical periods for OECD countries, may differ from unity (Causa et al., 2015, 2016).

The two different specifications imply a difference in the way policy effects on AHDI are evaluated. In both cases, a policy shock ΔX_i is considered for each policy *i*, with the magnitude of these shocks computed in Égert and Gal (2017) as representing a typical reform, as the average change in a two-year window when policy moves in the reform direction, averaged over time and across countries. The effect of such a reform is first calculated through its estimated effect on employment,[8] capital and total factor productivity and then the effect on GDP is derived by aggregating these component effects assuming a Cobb-Douglas production function. Consequently, for each policy instrument *i,* there is an associated shock, ΔX_i, and effect on GDP, $\Delta\, ln(GDP_i)$, computed in Égert and Gal (2017). The corresponding long-run effect on AHDI, $\Delta ln(AHDI_i)$, is then computed using both specification (1A) and (1B) as follows:[9]

Based on (1A): $\Delta ln(AHDI_i) = \Delta\, ln(GDP_i) + \gamma_i \Delta X_i$ (2)

Based on (1B): $\Delta ln(AHDI_i) = \beta\, \Delta\, ln(GDP_i) + \mu_i \Delta X_i$ (3)

1. Greater confidence regarding a differential policy effect between GDP and AHDI is then warranted if: (i) the estimated coefficients γ_i and μ_i are statistically significant; and (ii) to the extent there is broad consistency in the magnitude of the overall effect on AHDI from both (2) and (3). Conversely, if the coefficients γ_i and μ_i associated with a particular policy, X_i, are both statistically insignificant, then there is a greater presumption that the (percentage) effect on ADHI is similar to that on GDP.

6. Estimation results and policy effects

The estimation results (Table 1) suggest that the freely-estimated coefficient on logged GDP in equation (1B) is 0.7448 and significantly less than unity, confirming earlier results by Causa et al. (2015). Hence, policy effects on AHDI are computed on the basis of both equations (2) and (3) (Table 2 and Figure 4and Figure 5).

[8] Employment effects are estimated separately for four demographic groups and then weighted together to derive an aggregate employment effect. For more details, see Box 1 in Égert and Gal (2017).

[9] Note the estimated coefficients on the policy instruments will also depend on whether the unit elasticity on GDP is imposed, as acknowledged in equations (2) and (3) by the different coefficients γ_i and μ_i on the policy instrument, X_i, estimated for specifications (1A) and (1B).

Table 1. Estimations explaining the differential between real AHDI and GDP

	Long-run effects (1A)	Long-run effects (1B)	Short-run effects (2A)	Short-run effects (2B)	Typical reform
Dependent var	**Log(AHDI)**	**Log(AHDI)**	**Log(AHDI)**	**Log(AHDI)**	
Constant	**-0.4332****	**2.3059****			
Log(real GDP)	1.0000 †	**0.7448****	1.0000 †	**0.4211****	
Policies primarily acting through MFP and capital channels					
Product Market Regulation (ECTR) indicator	0.0069	**0.0215****	0.0006	0.0044	-0.310
Business R&D by private sector, % of GDP	**-0.0210****	**-0.0206****	-0.0020	-0.0094	0.097
Trade openness, adjusted for country size[a]	**-0.0021****	**-0.0013****	**-0.0004***	-0.0002	4.010
Corporate income tax (CIT) revenues, % of GDP[b]	**0.0066****	**0.0085****	-0.0026	-0.0025	-0.980
Long-term real interest rate	**0.0046****	-0.0030	-0.0007	**-0.0034****	
Logged relative investment prices	0.0284	0.0287	-0.0246	0.0191	
Policies primarily acting through the employment channel					
Employment Protection Legislation (EPL) indicator, permanent contracts	**0.0409****	0.0087	**0.0181****	0.0124	-0.295
ALMP spending (per unemployed, % of GDP per capita)	**-0.0009****	-0.0002	**0.0015****	**0.0017***	3.180
Average tax wedge (single earner couple with 2 children)	**-0.0010****	**-0.0014****	-0.0006	-0.0006	-2.282
Minimum to median wage	-0.0003	-0.0003	**0.0002***	0.0001	-2.480
Unemployment benefit replacement rate	-0.0006	-0.0004	**0.0007****	0.0005	-1.417
Excess coverage	**0.0011****	**0.0013****	0.0000	0.0001	-1.890
Total cash benefits, % of GDP	**0.0291****	0.0142	**0.0320****	**0.0228****	0.160
Total in-kind benefits, % of GDP	0.0145	**0.0338****	0.0047	0.0055	0.109
Maternity weeks	-0.0007	0.0008	0.0004	0.0002	4.830
Other determinants					
Log(real energy prices)	**-0.2201****	**-0.1872****	**-0.1064****	**-0.1080****	
Regression diagnostics					
Error correction term	**-0.1946****	**-0.2557****			
Adjusted R-squared	0.973	0.995			
No. of observations	473	440			
No. of countries	27	27			
Country fixed effects	YES	YES			
Time fixed effects	YES	YES			

Note: AHDI is defined as real adjusted household disposable income, with base year in 2017, and adjustments done for in-kind government benefits. * and ** denote statistical significance at the 10% and 5% levels, respectively, based on heteroscedasticity-robust standard errors, estimated using the Dynamic OLS (DOLS) estimator proposed by Stock and Watson (1993) with one lead and one lag (DOLS [1,1]). † The coefficient of 1.0 is imposed on logged real GDP in equation (1A) and this restriction is relaxed in equation (1B). Figures in bold are the variables, for which coefficients are statistically significant to at least the 10% level of significance. The size of a typical reform is reported for all policy variables in the final column.

Table 2. Long-term effects of structural policies on GDP and AHDI

Policy	Size of typical reform:	Total long-term effect on:		
		GDP	AHDI from eq(1A)	AHDI from eq(1B)
Policies primarily acting through MFP and capital channels				
Energy, Communication and Transport Regulation (ECTR) indicator	-0.307	2.09%	1.88%	**0.90%**
Business R&D by private sector, % of GDP	0.097	0.46%	**0.26%**	**0.14%**
Trade openness, adjusted for country size	4.007	2.40%	**1.56%**	**1.27%**
Corporate income tax revenues, % of GDP	-0.980	1.25%	**0.60%**	**0.10%**
Policies primarily acting through the employment channel				
Employment Protection Legislation (EPL) indicator, permanent contracts	-0.295	1.83%	**0.62%**	1.11%
ALMP spending (per unemployed, % of GDP per capita)	3.180	0.85%	**0.56%**	0.57%
Average income tax wedge (single earner couple with 2 children)	-2.282	0.47%	**0.70%**	**0.67%**
Minimum to median wage	-2.479	0.70%	0.77%	0.60%
Unemployment benefit replacement rate	-1.417	0.45%	0.54%	0.39%
Excess coverage	-1.890	0.15%	**-0.06%**	**-0.13%**
Total cash benefits, % of GDP	0.160	0.00%	**0.47%**	0.23%
Total in-kind benefits, % of GDP	0.109	0.24%	0.40%	**0.55%**
Maternity weeks	4.829	0.61%	0.27%	0.84%

Note: GDP effects are based on simulation results using the magnitude of typical policy reforms, both taken from Égert and Gal (2017). The percentage change in AHDI from equations (1A) and (1B) is then calculated according to equations (2) and (3), respectively, as explained in the main text. Where coefficient estimates suggest the difference between the GDP and ADHI are statistically significant to at least the 10% level of significance, the ADHI effects are bolded in the table. Note the absence of a bolded figure does not mean that the ADHI effects are insignificantly different from zero, but rather just insignificantly different from the GDP effects.
Source: Authors' calculations.

The estimation coefficient on real energy prices is highly significant in both specifications and suggests that a 10% increase in real energy prices experienced by households and firms drives a wedge between ADHI and GDP of about 2%, with about of half of this effect experienced in the first year following the shock.

More interestingly, as regards the estimated policy coefficients, those associated with policies that operate through the productivity or investment channels are mostly statistically significant with a sign that tends to *dampen* the original GDP effects estimated in the Égert and Gal (2017). Conversely, most, but not all, of the estimated coefficients associated with policies that operate through the employment channel have a sign that tends to *magnify* the original GDP effects, although fewer coefficients are statistically significant (to at least the 10% significance level). In more detail, the following groups of policy effects can be identified.

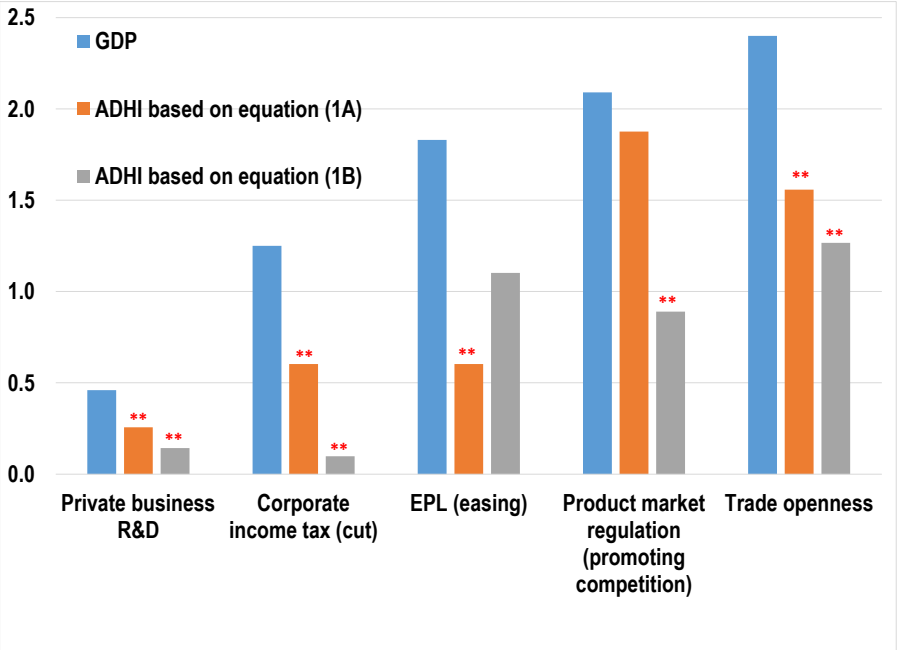
- A first group of policies operating mainly through the multi-factor productivity or the capital intensity channels generate significantly smaller effects on AHDI than GDP, perhaps because they imply a disproportionate part of the increase in GDP is allocated to corporate profits.
  - Policies that stimulate business R&D are estimated to raise both long-run GDP and ADHI, but both specifications (1A) and (1B) suggest the effect on ADHI is significantly smaller, with the long-run percentage change in ADHI around one-half or less of the corresponding percentage change in GDP, across both specifications (Table 2, Figure 4).
  - Cuts in corporate tax are estimated to raise both long-run GDP and ADHI, but both specifications (1A) and (1B) suggest the effect on ADHI is significantly smaller, with the long-run percentage change in ADHI less than one-third the corresponding change in GDP, taking the average across both specifications.

- Improvements in product market regulation which stimulate competition are estimated to raise AHDI almost proportionately with GDP according to specification (1A), but by less than half of the percentage increase in GDP according to specification (1B).[10]
- Improvements in trade openness are estimated to raise both AHDI and GDP, but according to both specifications the percentage rise in AHDI is only around two-thirds or less of the percentage increase in GDP, with the differential being statistically significant in both specifications. Trade openness is included in the regression as an intermediate outcome variable rather than a direct policy lever, although it reflects the effect of trade liberalisation and other trade policy measures.
- A loosening of employment protection legislation (EPL) is estimated to raise both long-run GDP and AHDI, but the percentage increase in AHDI is only around one-half or three-quarters of the percentage increase in GDP, according to specifications (1A) and (1B), respectively, although the differential is only statistically significant in the former case. EPL is unusual in being a policy that operates through both the employment and capital channels in Égert and Gal (2017) and implies a larger long-run percentage increase in GDP than AHDI, although this might be explained by the fact that a loosening of EPL will typically imply an increase in the bargaining power of firms versus organised labour and so may lead to reduced wages.

[10] The level of product market regulation is proxied via the OECD indicator (ETCR) for regulation in the energy, transport and communications sectors (Vitale, Danitz and Wanner, 2020). It summarises regulatory provisions in seven sectors: telecoms, electricity, gas, post, rail, air passenger transport, and road freight in OECD countries over 1975-2018. The value of the indicator ranges from 0 to 6 from the most to the least competition-friendly regulatory regime. The reason why this indicator is used over other product market regulation indicators (e.g. the OECD economy-wide Product Market Regulation, PMR indicator) is the comparatively wide country and time coverage.

Figure 4. Policies that have bigger effects on GDP than ADHI

Long-run % changes in GDP and ADHI for a typical policy reform



Note: Long-run effects are shown for policies where the % change in GDP is greater than the % change in ADHI based on the calculations reported in Table 2 above. Although the calculations are based on reforms which are computed to be a typical magnitude, the main interest here the differential impact a given reform has on GDP or ADHI, rather than comparing different magnitudes across reforms. In this respect, * or ** denote that the difference between policy effects is statistically significant between ADHI and GDP at the 10% or 5% significance level, respectively, but the absence of * or ** does not mean that the effect on ADHI is insignificantly different from zero.
Source: Authors' calculations.

- A second group of policies, which all operate through the employment channel, boost AHDI more than GDP over the long term, partly because they also raise incomes for households already in employment:
  - According to previous results reported in Égert and Gal (2017), a given increase in spending on family in-kind benefits (which is predominantly on child care) is estimated to raise long-run GDP by more than double the fiscal outlay cost, mainly by boosting female employment.[11] The estimated long-run percentage effect on AHDI compared to GDP is further doubled, taking the average across the two specifications, although the relevant differential policy coefficient is only statistically significant in specification (1B) not (1A) (Table 2, Figure 5). The larger effect on AHDI is explained by the fact that it is not only women transitioning into employment who benefit from the provision of childcare facilities, but that such services increase the incomes of already employed workers as well as inactive people.
  - An increase in family cash benefits was previously found to not have any significant long-run impact on employment or GDP in Égert and Gal (2017), although it has a significant long-run impact on AHDI in specification (1A), but not (1B). Compared to an increase in family in-kind

[11] A standardised typical policy shock to increase family in-kind benefits at a fiscal cost of 0.11 percentage points of GDP is estimated to raise long-run GDP by 0.24% through increasing female employment.

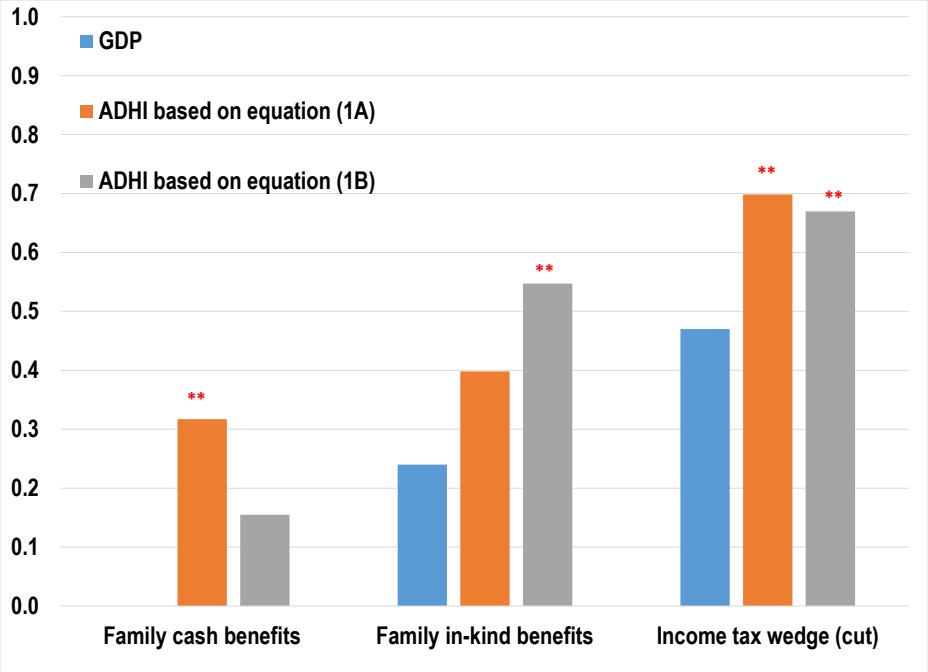
benefits having a similar fiscal cost, the effect of family cash benefits on AHDI in the long run is lower by more than one-half.[12]

- Lowering the average tax wedge for a worker on median wages with a family has a nearly 50% larger long-run percentage impact on AHDI than GDP, with this differential statistically significant in both specifications.

Another characteristic of these policies is that they tend to have a relatively rapid effect on AHDI: whereas the first-year effect of most of these structural labour market polices on employment is typically only 10-25% of the long-run effect,[13] the first-year effect on AHDI is typically more than half the long-run impact. The higher short-term impact on AHDI may be explained by the fact that the transfer payments or income tax cuts materialise quickly, without the need for the recipient to transition into employment.

Figure 5. Policies that have bigger effects on ADHI than GDP

Long-run % changes in GDP and ADHI for a typical policy reform



Note: Long-run effects are shown for policies where the % change in ADHI is greater than the % change in GDP based on the calculations reported in Table 2. Although the calculations are based on reforms which are computed to be a typical magnitude, the main interest here the differential impact a given reform has on GDP or ADHI, rather than comparing different magnitudes across reforms. In this respect, * or ** denote that the *difference* between policy effects is statistically significant between ADHI and GDP at the 10% or 5% significance level, respectively, but the absence of * or ** does not mean that the effect on ADHI is insignificantly different from zero.
Source: Authors' calculations.

[12] Increases in family in-kind benefits and family cash benefits, both at an *ex ante* fiscal cost of 0.11 percentage points of GDP, are estimated to raise long-run AHDI by 0.35% and 0.22%, respectively, where these results are the averages across specifications (1A) and (1B).

[13] The effect of additional spending on active labour market polices is an exception having a first-year effect on employment that is close to the long-run effect.

- A third group of policies is characterised by long-run effects on AHDI (in percentage terms) that are similar and insignificantly different to GDP, although there are sometimes important sign differences between short- and long-run effects:
  - The long-run coefficients on the unemployment benefit replacement rate are relatively small and not statistically significant in either specification (1A) or (1B), implying that changes in this policy variable have a similar long-run effect on AHDI and GDP. More striking, however, is the relatively large positive coefficient on the short-term dynamic form of this policy variable, which implies that while a cut in the benefit replacement rate will raise employment, GDP and ADHI in the long run, in the short run it will lead to a substantial fall in ADHI.
  - The coefficients on the minimum wage variable are relatively small and not statistically significant in either specification (1A) or (1B), implying that changes in this policy variable have a similar long-run effect on AHDI and GDP. Again what is more noteworthy, is the relatively large positive coefficient on the short-term dynamic form of this policy variable, which implies that while a cut in the minimum wage will raise employment, GDP and ADHI in the long run, in the short run it will lead to a substantial fall in ADHI.
  - The coefficients on excess coverage of wage bargaining agreements are statistically significant in both specifications and imply the long-run effects on GDP and ADHI have opposite signs: an increase in the excess coverage of wage bargaining agreements leads to higher employment and GDP, but lower AHDI, presumably because it reduces wages.

7. Policy relevance in addressing the 'cost of living crisis'

In response to the 'cost of living crisis', governments are rolling out temporary, timely and well-targeted fiscal measures to provide support to vulnerable households (OECD, 2022).[14] Such policies might be contrasted with the structural reform measures that are the focus of the current study, which are typically more permanent in nature and usually take many years to raise the supply-side potential of the economy. However, the preceding analysis has highlighted there are some structural policies that particularly focus support on household incomes and also boost household incomes quickly as well as improve the long-run supply side potential of the economy. Such policies could be considered as part of packages to address the on-going cost of living crisis faced by many OECD households.

Cross referencing the aforementioned characteristics with previously identified structural reform priorities in OECD countries, highlights additional support for early childhood education and childcare as being particularly appropriate to address the cost of living crisis. Additional support for childcare has been identified as one of the top priorities in the OECD's latest *Going for Growth* review of structural reforms priorities for no fewer than 22 OECD countries, including all G7 countries (Table 3) (OECD, 2021). Support for early childhood education and childcare currently represents over 70% of family in-kind benefit payments across OECD countries. Such spending varies widely across OECD countries (Figure 6), with Nordic countries spending as a share of GDP more than double the OECD median. While there may be diminishing returns to additional such spending at higher initial levels (Rosen, 1996),[15] this still leaves substantial scope to increase spending in the majority of OECD countries. Finally, it should also be noted that there may be an additional long-run supply-side benefit from boosting spending on early childhood

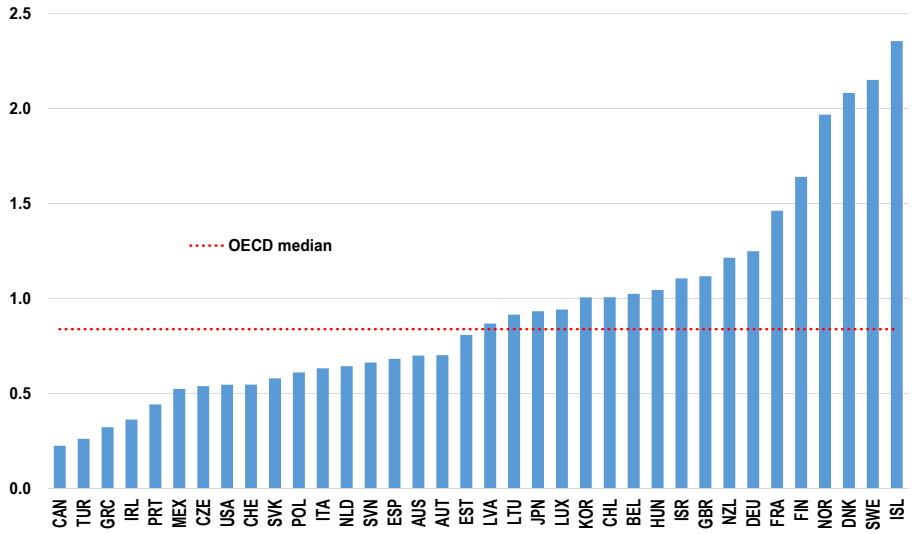
[14] In the latest forecasts published by the OECD (2022), the differential between the growth rate of real household disposable income and GDP is, unusually, negative for practically every OECD country in both 2021 and 2022, and the magnitude of this differential in many countries is either unprecedented or has not been experienced since the 1970s.

[15] It is noteworthy that none of the top four spending countries have recommendations to further increase spending in the OECD's latest Going for Growth (OECD, 2021).

education via a long-run improvement in human capital and total factor productivity (Égert et al, 2022), which is not reflected in any of the preceding calculations.

Figure 6. Public spending on family in-kind benefits

Percent of GDP, 2019 or nearest year available



Source: OECD Social Expenditure Database.

8. Concluding remarks

The paper provides a number of interesting and policy-relevant takeaways. First, increases in the real energy prices experienced by consumers and industry drive a pronounced wedge between real GDP and real adjusted household disposable income: for the typical OECD country, every 10% increase in real energy prices reduces AHDI relative to GDP by about 2%.

Second, some structural reform policies -- including in-kind family benefits, family cash benefits and cuts in the income tax wedge paid by a worker on median wages with a family -- have a magnified effect on AHDI, so that following a policy reform, long-run percentage changes in AHDI are larger than for GDP. All these policies work by boosting employment, and raise AHDI more than GDP partly because they also raise income for households already in employment. This also means they tend to have a more rapid effect on AHDI than employment.

Third, at the current conjuncture, these results provide a particularly strong case for increasing support to early childhood education and childcare, which represents over 70% of family in-kind benefit payments across OECD countries. Not only would such policies boost long-run employment and have a rapid and magnified effect on household disposable incomes, but, based on a recent comprehensive OECD evaluation of structural policy requirements, they are currently identified as being among the top structural reform priorities in 22 OECD countries, including all G7 countries.

Fourth, Another group of structural policies, typically those where the transmission mechanism depends mainly on productivity and capital intensity, have weaker long-run effects on AHDI than GDP. Thus, while cuts in corporate taxes and policies that stimulate private business R&D still raise ADHI, the (percentage) effects are estimated to be less than half their long-run effects on GDP. Similarly, policies that promote

trade openness or improve competition in product markets raise AHDI, but the percentage increase in AHDI is reduced by more than one-third relative to the gains in GDP. Other policies which may weaken the bargaining power of labour, for example a loosening of employment protection legislation, result in weaker long-run effects on AHDI than GDP, and whereas a reduction in the excess coverage of collective wage agreements is expected to have positive long-run effects on employment and GDP it is estimated to reduce ADHI.

Finally, for other structural policies the long-run effects on AHDI (in percentage terms) are insignificantly different to GDP, although there are sometimes important sign differences between short- and long-run effects. For example, while cutting the unemployment benefit replacement rate or minimum wage may increase employment, GDP and ADHI in the long run, they substantially reduces ADHI in the short run.

Table 3. OECD recommendations relating to childcare and early childhood education

Australia	Make high quality childcare and full-day schooling a legal entitlement in the entire country.
Canada	Improve childcare provision through increased subsidies and tougher quality control.
Chile	Expand the provision of high-quality childcare including public early childhood education.
Costa Rica	Rebalance education spending towards early childhood and secondary education. Continue to increase the supply of affordable childcare and to strengthen targeted support for at-risk students.
Colombia	Expand access to early childhood education and its quality, particularly in rural areas.
Czech Republic	Keep expanding the supply of affordable and high-quality childcare facilities.
Finland	Improve access to early childhood education and care services by ensuring that those municipalities that do not provide sufficient places in convenient locations with suitable opening hours do so
France	Speed up the development of additional childcare services for low-income households and in poor neighbourhoods.
Germany	Raise quality standards in childcare and early childhood education while further expanding availability and flexibility of care
Greece	Complete the roll-out of compulsory pre-school for 4 year olds and expand access for younger children to early childhood education and care.
Hungary	Continue to expand the availability of childcare facilities for children below the age of three.
Israel	Further strengthen participation in high-quality pre-school education, and expand day care centres, particularly in poor and disadvantaged localities.
Italy	Support increased access to early childhood development and child care for 0-3 year olds.
Japan	Improve the social security system, rules and childcare provision to support workers with different working arrangements
Mexico	Expand access to good quality and affordable childcare.
New Zealand	Boost the participation to early childhood education by disadvantaged groups by ensuring high quality and conveying the improved educational outcomes from such participation.
Poland	Continue to improve access to affordable childcare and adapt it to the working hours of less skilled workers to encourage less-qualified mothers to return to work.
Slovak Republic	Enhance access to early childhood education and care for younger children. Make a significant part of the parental allowance conditional on fathers taking a share of the parental leave.
Switzerland	Improve accessibility and quality of childcare services.
Turkey	Increase support for full-time good-quality childcare, notably by limiting costs relative to disposable income to facilitate full-time work and schooling for second earners.
United Kingdom	Increase support for full-time good-quality childcare, notably by limiting costs relative to disposable income to facilitate full-time work and schooling for second earners.
United States	Require paid parental leave and improve access to quality childcare to help reduce wage gaps and improve career prospects.

Note: The table quotes structural reform priorities relating to childcare and early childhood education from the latest of the OECD's regular reviews of structural reform priorities across all OECD countries.
Source: *Going for Growth*, OECD, OECD Publishing, Paris, 2021.

References

Akgun, O., B. Cournède and J. Fournier (2017), "The effects of the tax mix on inequality and growth", *OECD Economics Department Working Papers*, No. 1447, OECD Publishing, Paris.

Causa, O., et al. (2014), "Economic growth from the household perspective: GDP and income distribution developments across OECD countries", *OECD Economics Department Working Papers*, No. 1111, OECD Publishing, Paris.

Causa, O., A. de Serres and N. Ruiz (2015), "Can pro-growth policies lift all boats?: An analysis based on household disposable income", *OECD Economics Department Working Papers*, No. 1180, OECD Publishing, Paris, .

Causa, O., M. Hermansen and N. Ruiz (2016), "The distributional impact of structural reforms", *OECD Economics Department Working Papers*, No. 1342, OECD Publishing, Paris.

Deaton, A. (2020), "Why the world's richest countries are not at all rich", *Financial Times*.

Égert, B. and P. Gal (2017), "The quantification of structural reforms in OECD countries: A new framework", *OECD Economics Department Working Papers*, No. 1354, OECD Publishing, Paris.

Égert, B., C. de la Maisonneuve and D. Turner (2022), "A new macroeconomic measure of human capital exploiting PISA and PIAAC: Linking education policies to productivity", OECD Economics Department Working Papers, No. 1709, OECD Publishing, Paris, https://doi.org/10.1787/a1046e2e-en.

Fournier, J. and Å. Johansson (2016), "The effect of the size and the mix of public spending on growth and inequality", *OECD Economics Department Working Papers*, No. 1344, OECD Publishing, Paris.

Hermansen, M., N. Ruiz and O. Causa (2016), "The distribution of the growth dividends", *OECD Economics Department Working Papers*, No. 1343, OECD Publishing, Paris.

OECD (2015), *National Accounts at a Glance 2015*, OECD Publishing, Paris.

OECD (2016a), "What does GDP per capita tell us about households' material well-being", October 6th, OECD Statistics Directorate, Statistical Insights blogpost.

OECD (2016b), *Economic Policy Reforms 2016: Going for Growth Interim Report*, OECD Publishing, Paris.

OECD (2020), *How's Life? 2020: Measuring Well-being*, OECD Publishing, Paris.

OECD (2021), *Going for Growth*, OECD Publishing, Paris.

OECD (2022), *OECD Economic Outlook*, June, OECD Publishing, Paris.

Rosen, S. (1996). Public Employment and the Welfare State in Sweden. Journal of Economic Literature, 34(2), 729–740. http://www.jstor.org/stable/2729220.

Stiglitz, J., A. Sen and J.-P. Fitoussi (2009), "*Measurement of Economic Performance and Social Progress", Report by the Commission on the Measurement of Economic Performance and Social Progress.*

Stock, J. and M. W. Watson (1993), "A simple estimator of co-integrating vectors in higher order integrated systems", *Econometrica*, Vol. 61(4), pp. 783–820.

Turner, D. and H. Morgavi (2020), "Revisiting the effect of statutory pension ages on the participation rate", OECD Economics Department Working Papers, No. 1616, OECD Publishing, Paris, https://doi.org/10.1787/3f430e2b-en.

Vitale, C., E. Danitz and I. Wanner (2020), "Product Market Regulation Network Sectors Indicators: Methodology for calculating the 1975-2018 time series", OECD Publishing, Paris.