APPENDIX: SUPPLEMENTARY TECHNICAL MATERIAL

This appendix provides supplementary technical information related to the analysis of the article "The Decoupling of Median Wage for Productivity in OECD Countries" in four areas: evolution of deflators; imputation of the compensation of the self-employed; gross versus net labour shares; and share of housing in total value added.

Evolution of deflators

For the countries covered by the analysis as a whole, the growth differential between the consumption deflator and the value added deflator has been small and depends on the precise measure of the consumption deflator. The consumer price index has grown more than the gross value added deflator over the sample period, but the households' final consumption expenditure deflator from the national accounts has grown less (Appendix Chart A1). Consequently, the growth rate of real median compensation based on the consumer price index has been below the rate based on the value added deflator while the growth rate of real median compensation based on the households' final consumption expenditure deflator has been above (Appendix Table A1).

The wedge between the value added and consumption deflators is largely driven by countries' external terms of trade since both consumption deflators include imported goods whereas the value added deflator includes only domestic production. Indeed, for a number of commodity-exporting countries including Australia, Canada and Norway, real compensation based on a consumption deflator has grown less

Chart A1: Value Added and Consumption Deflators, OECD average, total economy, 1995-2014

Index, 100=1995
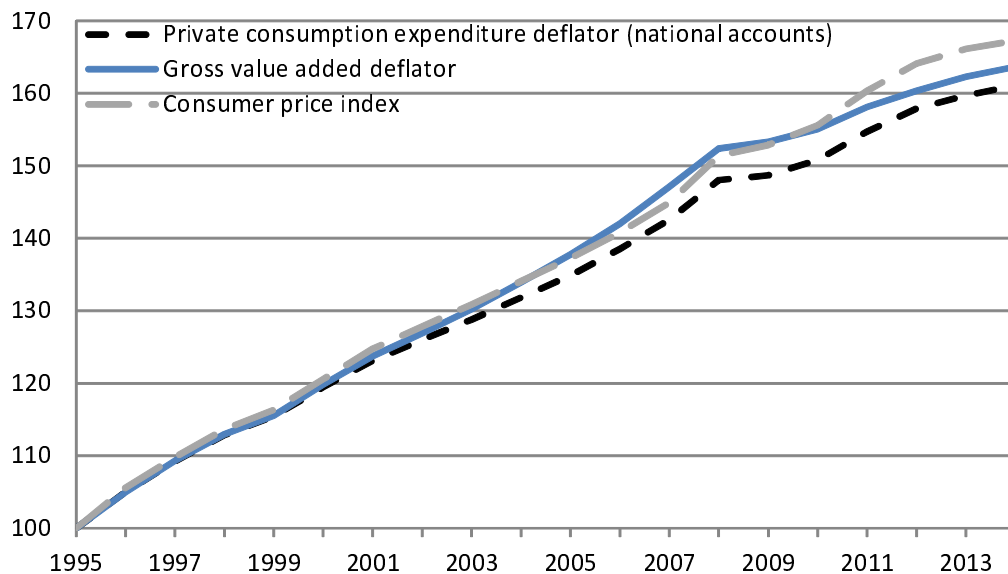
Note: 1995-2013 for Australia, Austria, Belgium, Germany, Finland, Hungary, Japan, Korea and United Kingdom; 1996-2013 for Czech Republic, Denmark; 1997-2013 for Canada; 1998-2013 for Ireland, Norway and United States; 1995-2012 for Spain, France, Italy, Poland and Sweden; 1997-2012 for New Zealand; 1995-2010 for Netherlands; 2001-2011 for Israel; 2003-2013 for Slovak Republic.

Source: OECD National Accounts Database, OECD Earnings Database.

Table A1: Real Median Compensation Growth Based on Value Added and Consumption Deflators in OECD Countries, total economy, 1995-2013

Annualised growth rates

	Gross value added deflator	Consumer price index	Households' final consumption expenditure deflator
Australia	0.4	0.7	0.9
Austria	0.7	0.2	0.4
Belgium	0.8	0.4	0.6
Canada	0.2	0.4	0.8
Czech Republic	2.2	1.4	2.0
Denmark	0.8	0.9	1.1
Finland	1.1	1.1	0.9
France	1.0	0.8	1.1
Germany	0.5	-0.3	0.0
Hungary	0.9	0.3	0.5
Ireland	1.0	0.8	1.4
Israel	0.4	-0.2	-0.2
Italy	-0.1	-0.2	-0.2
Japan	0.3	-0.6	0.0
Korea	2.0	1.0	0.9
Netherlands	0.6	0.6	0.7
New Zealand	0.8	0.8	1.3
Norway	-0.7	2.6	2.6
Poland	2.0	1.6	1.8
Slovak Republic	3.3	1.8	2.0
Spain	0.6	0.4	0.4
Sweden	2.0	2.3	2.1
United Kingdom	1.1	1.3	1.6
United States	0.2	0.0	0.4
OECD	0.9	0.8	1.0
G7	0.4	0.2	0.5

Note: OECD and G7 refer to unweighted averages for the relevant countries included in the Table. 1996-2013 for Czech Republic, Denmark; 1997-2013 for Canada; 1998-2013 for Ireland, Norway and United States; 1995-2012 for Spain, France, Italy, Poland and Sweden; 1997-2012 for New Zealand; 1995-2010 for Netherlands; 2001-2011 for Israel; 2003-2013 for Slovak Republic.

Source: OECD National Accounts Database, OECD Earnings Database.

than real compensation based on the value added deflator irrespectively of the precise measure of the consumption deflator used in the analysis (Appendix Table A1).

Imputation of Compensation of the Self-employed

Wages of the self-employed are commonly imputed using the average hourly wage of dependent employees in the total economy

Chart A2: Effect of the Imputation Method for Self-Employed Compensation on Labour Shares in OECD Countries, 1995-2014

Total economy, percentage points
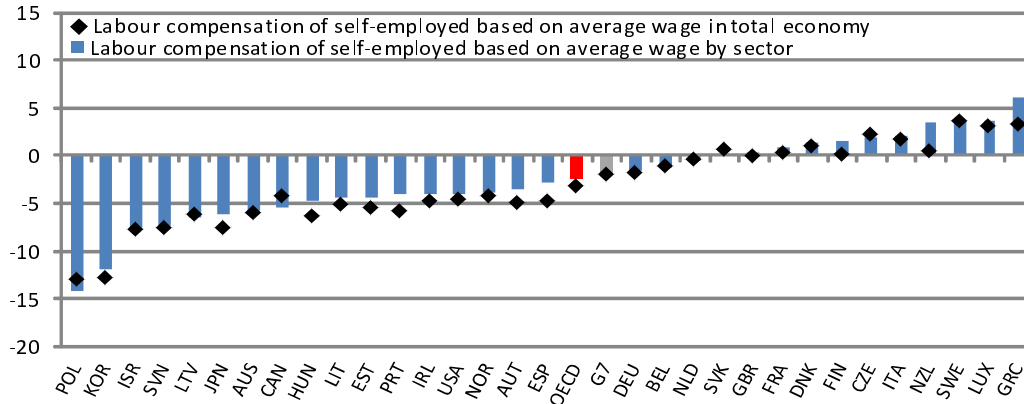
Note: Three-year averages starting and ending in indicated years. 1995-2013 for Australia, France, Korea and Portugal; 1995-2012 for New Zealand; 1997-2012 for Canada; 1997-2014 for United Kingdom; 1998-2014 for Ireland and United States.

Source: OECD National Accounts Database.

(International Labour Organisation *et al.*, 2015a and 2015b).[1] This approach fails to account for inter-industry wage differentials, which can be large. For instance, a self-employed person in the financial industry is unlikely to earn a similar compensation to a self-employed person in the agricultural sector. Consequently, this article is based on labour compensation of the self-employed imputed at the sector level. Developments in total-economy labour shares in a number of individual countries are sensitive to the imputation method of wages of the self-employed, but the OECD average is roughly unchanged (Appendix Chart A2). Alternative wage imputation methods for self-employed workers are discussed in Cho *et al.* (2016). As they argue, from a theoretical point of view, the best procedure is to make this imputation based on micro-level information on the socio-economic status of self-employed workers. In the absence of such data, the second-best solution is to make this imputation based on industry-level national accounts data as done in this article.

Gross versus Net Labour Shares

The increase in the share of capital depreciation in value added is commonly viewed as reflecting the increased share of rapidly depreciating ICT capital in the total capital stock. If the elasticity of substitution between ICT equipment, non-ICT equipment and labour in the production function is sufficiently large, a fall in the price of ICT capital induces an increase in the share of depreciation in value added and thus a larger decrease in the gross labour share than the net labour share (Bridgman, 2014). By contrast, if the elasticity of substitution is below some critical threshold, the increase in the relative volume of the ICT capital stock is offset by a fall in its relative price so that this substitution effect does not lead to any increase in the share of capital depreciation in value added at current

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1 According to the 2008 System of National Accounts, "the relationship of employer to employee exists when there is a written or oral agreement, which may be formal or informal, between an enterprise and a person, normally entered into voluntarily by both parties, whereby the person works for the enterprise in return for remuneration in cash or in kind. The remuneration is normally based on either the time spent at work or some other objective indicator of the amount of work done".

Chart A3: Association between the Depreciation Rate in Volume and Share of ICT Capital in Volume in Selected OECD Countries, 1995-2013
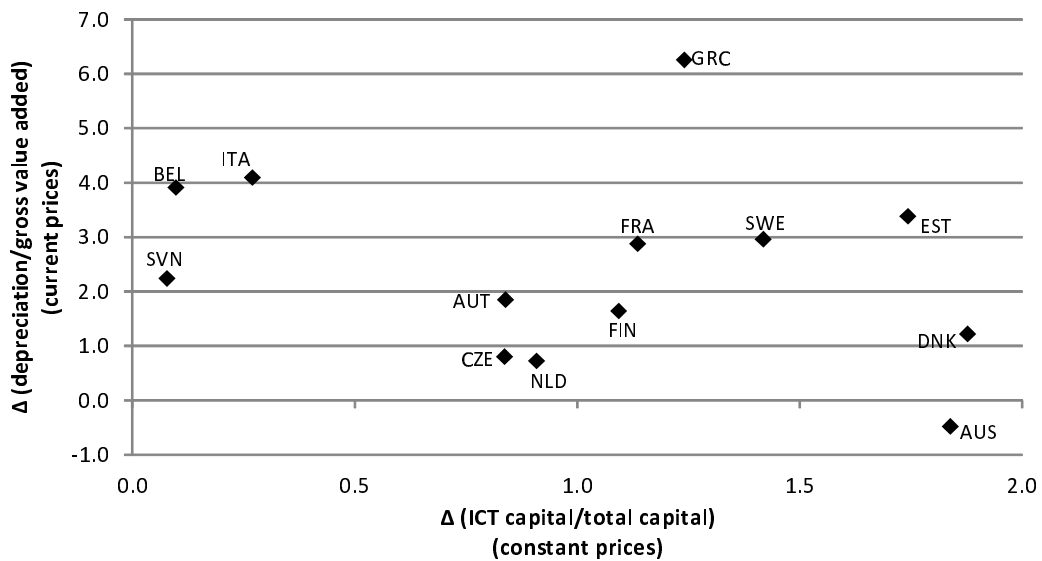
Percentage point changes
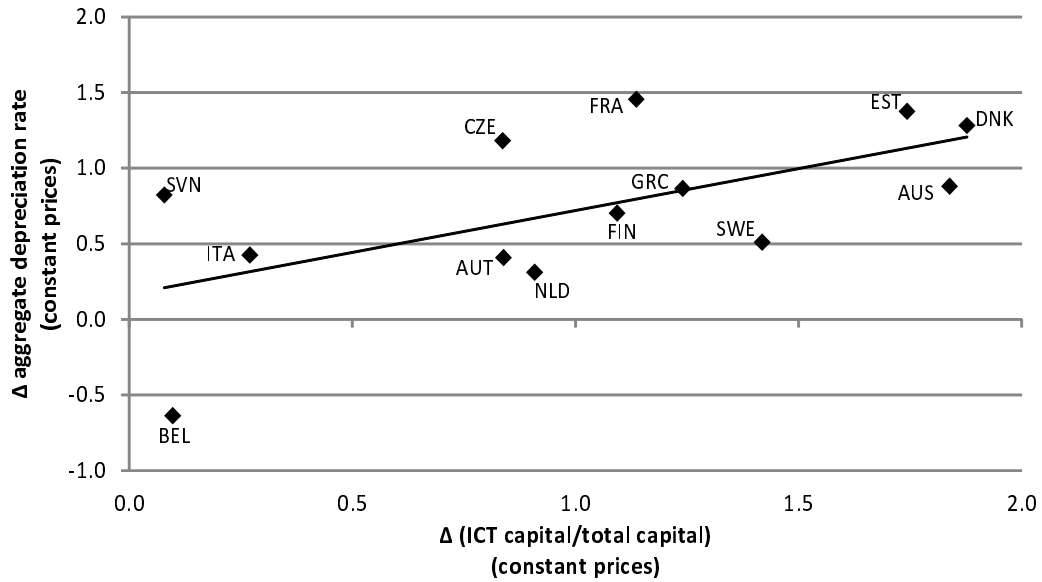
Note: Three-year averages starting and ending in indicated years. Belgium (1996-2013); Estonia, Netherland and Slovenia (2000-2013). Depreciation rate refers to the ratio of depreciation to total capital stock.

Source: OECD National Accounts Database.

Chart A4: Value Added Share of Depreciation and Share of ICT capital in Total Capital in Selected OECD Counties, 1995-2013
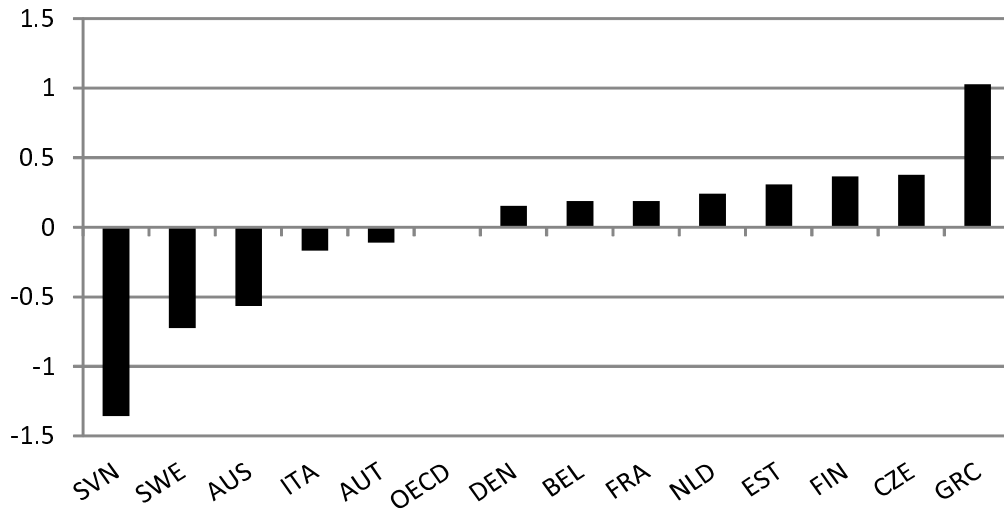
Percentage point changes

Note: Three-year averages starting and ending in indicated years. Belgium (1996-2013); Estonia, Netherland and Slovenia (2000-2013).

Source: OECD National Accounts Database.

Chart A5: Change in ICT Capital/Total Capital Ratio in Selected OECD Countries, 1995-2013

Current prices, percentage point changes

Note: Three-year averages starting and ending in indicated years. OECD refers to unweighted average of the countries
    included in the Figure. Belgium (1996-2013); Estonia, Netherland and Slovenia (2000-2013)
Source: OECD National Accounts Database.

prices.

In volume terms, ICT capital has substituted other types of capital in most countries. Given that ICT capital depreciates more rapidly than non-ICT capital, this substitution has been associated with a proportionate increase of the aggregate depreciation rate in volume terms, that is, the ratio of aggregate depreciation to the

Chart A6: Change of Ratio of Housing to Total Gross Value Added in OECD Countries, 1995-2013

Change in percentage points
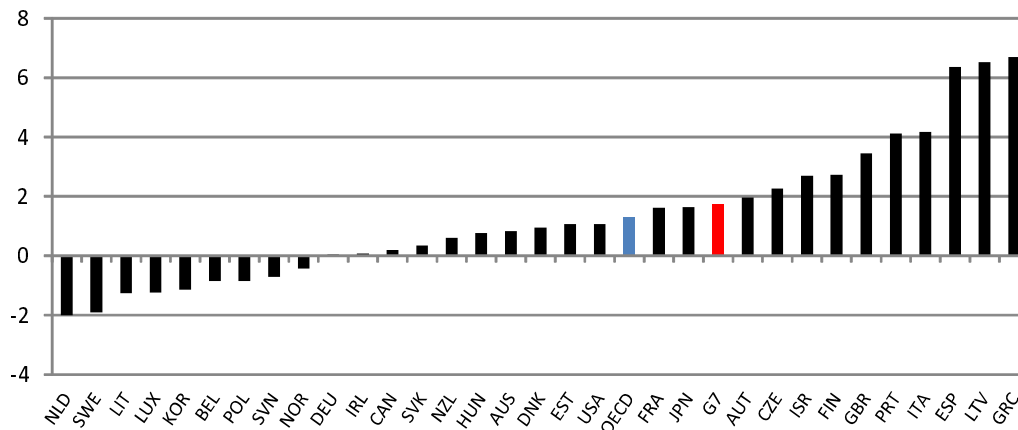
Note: Three-year averages starting and ending in indicated years. OECD and G7 refer to un-weighted averages over the
    relevant countries included in the figure. 1995-2013 for Austria, Australia, Belgium, Czech Republic, Denmark, Ger-
    many, Finland, United Kingdom, Hungary, Japan, Korea, Netherlands, New Zealand, Norway, Poland, Slovak Repub-
    lic, Sweden; 1998-2013 for Ireland, United States; 1995-2012 for New Zealand; 1997-2012 for Canada.

Source: OECD National Accounts Database.

aggregate capital stock at constant prices has increased (Appendix Chart A3).

However, for OECD countries, the substitution of rapidly-depreciating ICT capital for other types of equipment does not appear to be a major driver of the increase in the share of capital depreciation in value added at current prices. Actually, the substitution of ICT equipment for other types of equipment appears to be unrelated to the increase in the share of depreciation in value added at current prices (Appendix Chart A4).

The increase in the share of ICT capital in the total capital stock in volume terms appears to have been offset by the decline in its relative price so that the share of ICT capital in the total capital stock at current prices (i.e. in nominal terms) has remained broadly constant or even declined for the analysed OECD countries (Appendix Chart A5). Overall, substitution of rapidly-depreciating ICT capital for other types of equipment does not appear to be a major driver of the increase in the share of capital depreciation in value added at current prices.

Share of Housing in Total Value Added

In the national accounts, rents paid by tenants to landlords and imputed rents of home owner-occupiers are recorded as output of the housing sector and the overwhelming part of it ends up in gross operating surplus. This means that the labour share in the housing sector is well below the labour share of the total economy. Consequently, an increase in the share of housing to total value added puts downward pressure on the total economy labour share. Between 1995 and 2014, the share of the housing sector in total value added increased by more than 4 percentage points for Greece, Italy, Latvia, Portugal and Spain, and by more the 2 percentage points for Czech Republic, Finland, Israel and United Kingdom (Appendix Chart A6).