

Appendix IV

The effect of labour share on aggregate demand

Box A2 Data, estimation and simulations

Our simulations on the effects of lower labour shares on components of aggregate demand are based on elasticity estimates that assume single equations to explain (independently) each of the items that integrate aggregate demand, namely **GC** (government consumption), **C** (aggregate domestic private consumption on goods and services), **I** (aggregate private investment) and **NX** (aggregate net exports, i.e. the value of exports minus imports). It is assumed that functional income shares affect each of the components in the identity that explains national income **Y** (i.e. $Y = GC + C + I + NX$) but feedback effects between the components are not accounted for when providing final simulation effects. The simplification reduces the problem of using untestable assumptions on a system of equations; avoiding such assumptions allows for a clear policy-oriented interpretation of the results. The estimation process consists of three steps:

Step 1: Selecting the countries, the time-span and the databases

- **16 economies:** Eurozone (12 core high-income economies), Argentina, Australia, Canada, China, France, Germany, India, Italy, Japan, Mexico, Republic of Korea, South Africa, Turkey, United Kingdom, United States.
- **Time series periods:** 1960–2007 for developed economies; 1970–2007 for developing economies; 1978–2007 for China. The period of the crisis is omitted.
- **Dependent variables:** Growth in private consumption, investment, net exports.
- **Independent (causal) variables:** indicators of labour income shares and profit income shares. The labour income share (or labour wage share, LWS) has been adjusted in the same form as described in step 2 of Appendix III. Capital (or profit) income shares follow by construction from LWS: $CIS = 1 - LWS$. Other indicators include industrial share (IND), agricultural share (AGR), terms of trade (TOT), World GDP (wGDP), import prices (MP), export prices (XP), domestic prices (P), unit labour cost (ULC).
- **Databases and sources:** ILO/IILS, World Bank WDI, UNIDO; for Argentina and South Africa, Lindenboim et al. (2011) and UN National Accounts; for China, Zhou et al. (2010).

Step 2: Specification of long-run relationship between labour income shares and capital income shares and the dependent variables (C, I, NX):

The following specifications are applied to each economy independently:

$$\text{CONSUMPTION: } C_t = F[LWS_t, CIS_t, IND_t, AGR_t; e_t]$$

$$\text{INVESTMENT: } I_t = F[CIS_t, IND_t, AGR_t; e_t]$$

$$\text{EXPORTS: } M_t = F[TOT_t, wGDP_t, MP_t, P_t, ULC_t; e_t]$$

$$\text{IMPORTS: } X_t = F[TOT_t, wGDP_t, XP_t, P_t, ULC_t; e_t]$$

Box A2 Data, estimation and simulations (continued)

Assumptions:

- Single equation approach
- Long run relationship where the LWS and the CIS are exogenous to the aggregate demand component.

Step 3: Simulations

Effect of a 1 per cent decrease on LWS (1 per cent increase in CIS) on C, I, NX:

Estimate each of the causal relations in step 2, using log transformation in all variables, to find the elasticities (coefficients) of each variable included in the specification.

Apply the elasticities to the identities that explain each of the aggregated demand items (C, I, NX) in the form of marginal changes with respect to national income. Take the mean average change of consumption, income and net exports to be the mean average change observed over the period (in real terms).

Simultaneous decrease of 1 per cent LWS (1 per cent increase in CIS) on each country's total aggregate private demand:

Assume n economies where economy i is a trade partner of all other j economies in n . The simultaneous effect on a country's aggregated demand (AD) of a change in LWS in all n economies for an economy i is given as the sum of the following 4 components:

$$\% \Delta AD_i = \left(\begin{array}{l} \% \Delta GDP_i \\ + \\ \% \Delta AD_i \text{ given a } \% \Delta LWS_i \\ + \\ \text{National Multiplier effect on } AD_i \\ + \\ \sum_j \left(\% \Delta NX_j \text{ given a } \% \Delta LWS_j \right) \end{array} \right)$$

Results and interpretation

Our estimation strategy consists in using a dynamic framework on time series data for the period 1960–2007 to estimate elasticities of labour income shares for 16 economic units, individually, for each economy and for each of the three items in aggregate demand. The elasticities measure how responsive each of the aggregate demand components is to changes in labour income share. The demand side interpretation of national income assumes the existence of stable, long-run equilibrium between aggregate demand and labour income share. On the other hand, the modelling strategy assumes no feedback effects between the different aggregate demand components (consumption, investment and net exports) and a change in labour income shares. The simplification comes at the cost of potential imprecisions in the estimate of the elasticities. On the other hand, estimating single equations for each economy has the advantage that it avoids having to make untestable identifying assumptions that further complicate the interpretation of the results for the purpose of policy advice.⁵⁴ It is important to point out the duality in the estimation procedure: an elasticity that measures the impact of a change on any

given item (say, investment) for a 1 per cent fall (increase) in labour income share is equivalent to measuring the change on the same item for a 1 per cent increase (fall) in capital (i.e. profit) income share. Government consumption has been ignored because by definition government consumption is the same as public employment income share. In this respect, the wage shares in the empirical estimates that follow have been adjusted as described above.

The estimated elasticities are used in the empirical analysis in two different forms. First, they are used to simulate the change in consumption, investment and net exports (relative to GDP) caused by a 1 per cent fall in labour income share; this is simply done by multiplying the estimated elasticities by the observed mean value of the corresponding items in aggregate demand weighted by the factor prices. Second, the estimated elasticities are used in a more general framework to simulate the change in aggregate demand for any given economy (among the 16 economic units) if all other 15 economic units experienced a simultaneous 1 per cent fall in labour income share: the feedback effect is simulated assuming that each country's fall in labour income share has a measurable impact on its net exports.

Figure A1 shows the results of simulating the impact of a 1 per cent fall in labour income shares on each of the components of aggregate demand. Compared to investment and net exports, the response of private consumption of domestic goods is negative and substantial across all economic units: in this case it is not possible to distinguish between developed and developing economies as all seem to suffer losses of similar magnitude. With the exceptions of Argentina, Australia and South Africa, all countries and the eurozone as a whole would experience a drop in consumption of 0.3 per cent or more. In the case of economies with significantly large populations and, therefore, large internal markets (the eurozone, China, Germany, Mexico, Turkey, the United States), the drop in consumption is greater, ranging between 0.4 per cent and 0.5 per cent.

Whereas consumption falls, investment is positively affected by a decline in labour income share in all but six economic units, and in these the effect is non-zero but negligible: these are Argentina, China, India, the Republic of Korea, Turkey and the United States. One possible reason why investment is not sensitive to a fall in labour income share (i.e. to an increase in the profit income shares) in emerging economies is the lack of a correlation between firms' profits and overall investment, because in these countries public industrial policies and public investment are the drivers of infrastructure and industrial development. Thus, for most emerging economies, high investment rates are part of the authorities' attempt to create an optimal business environment – with a view to catching up in the global market – whereas short-term private profit shares have only weak effects on investment rates (Akyüz et al., 1998). The only advanced economy where an increase in profit share shows zero impact on investment is the United States: in an earlier study by Onaran et al. (2011), the inclusion of interest and dividend payments in the definition of investment for the United States was found to have confounding effects that made it impossible to detect the significance of an increase in capital income share (a drop in labour income share) for investment. The same might be happening in the present set of estimates.⁵⁵ For all other developed economies, the impact of a 1 per cent fall in labour income share (i.e. a 1 per cent increase in capital

income share) is to increase investment by 0.1 per cent or more. The effect is greatest in the eurozone (0.3 per cent), Germany (0.38 per cent) and Japan (0.29 per cent).

In the case of net exports, figure A1(c) shows that a 1 per cent drop in labour income share induces an increase in net exports in all countries. It is important to note that in the case of net exports the magnitude is estimated with a composite of elasticities that depend on the relative prices of exports and imports, the degree of openness of the economy and price elasticity at home.⁵⁶ The effects are larger for developing countries such as Mexico and South Africa and, as expected, extraordinarily high in China as this is the most aggressive export-led economy in the global market. It is illustrative to point out that the estimate of a 2 per cent increase in net exports for China (given a 1 per cent drop in labour income share in China) is composed of 1.1 per cent increase in the share of exports (in GDP) and a 0.9 per cent decline in import share (of GDP). These marked effects are related to several factors that characterize the Chinese labour market. First, the elasticity of prices with respect to unit labour costs is the highest in the world, indicating a highly labour-intensive export structure with high mark-ups. Second, the elasticity of exports with respect to relative prices is again the highest in the world, reflecting the highly price-elastic character of the demand for Chinese exports, which rely heavily on consumer goods such as textiles. Finally, the elasticity of imports with respect to relative prices is the second highest in the world after South Africa. This last point might also explain why South Africa shows the second highest impact on net exports among the 16 economic units of a 1 per cent drop in labour income share (figure A1(c)).

One might be tempted to add up all the independent effects for each of the economic units to illustrate the overall impact of a 1 per cent drop in labour income shares on private aggregate demand. This would be misleading, for figure A1 and the estimates leading to it ignore the feedback effects that exist between consumption, investment and net exports. Nevertheless, the estimates presented in figure A1 are informative: for most of the economies considered, the impact of lowering the labour share of income – say, by reducing wages below average productivity to gain competitiveness – is likely to have such a negative effect on domestic consumption (domestically traded goods and services) that it would require a massive response in the form of domestic investment and net exports to offset the adverse impact on aggregate demand. The findings are in line with those of Felipe and Kumar, who find that cutting unit labour costs (reducing the labour income share) is detrimental to economies that do not have a niche for their basket of exports in the global market: there is no gain in cutting unit labour costs when they compete with China to place a similar basket of exports in the global economy, for that cut in unit labour costs will simply deepen a county's recession further through the adverse effect on consumption (reducing effective demand) and investment (widening the technological gap) (Felipe and Kumar, 2011).

Figure A1 Effect of a 1% decrease in labour income share on private consumption of domestic goods and services, investment and net exports: (a) private consumption of goods and services; (b) investment; (c) net exports

	Private consumption	Investment	Net exports
Euro area-12	\ (-0.439)	/ (0.299)	/ (0.057)
Argentina	\ (-0.153)	→ (0.015)	/ (0.192)
Australia	\ (-0.256)	/ (0.174)	/ (0.272)
Canada	\ (-0.326)	/ (0.182)	/ (0.266)
China	\ (-0.412)	→ (0.000)	/ (1.986)
France	\ (-0.305)	/ (0.088)	/ (0.198)
Germany	\ (-0.501)	/ (0.376)	/ (0.096)
India	\ (-0.291)	→ (0.000)	/ (0.310)
Italy	\ (-0.356)	/ (0.130)	/ (0.126)
Japan	\ (-0.353)	/ (0.284)	/ (0.055)
Mexico	\ (-0.438)	/ (0.153)	/ (0.381)
Republic of Korea	\ (-0.422)	→ (0.000)	/ (0.359)
South Africa	\ (-0.145)	/ (0.129)	/ (0.506)
Turkey	\ (-0.491)	→ (0.000)	/ (0.283)
United Kingdom	\ (-0.303)	/ (0.120)	/ (0.037)
United States	\ (-0.426)	→ (0.000)	/ (0.037)

Note: The bracketed value shows the % change in each of the corresponding items: % change in private consumption of goods and services, % change in investment goods, % consumption of exports value minus import value (net export).

Source: Onaran and Galanis, forthcoming.