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Income distribution and aggregate demand: A global Post-Keynesian model

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Abstract — This paper estimates the effects of a change in the wage share on growth at a national and global level in the G20 countries. A decrease in the wage share leads to lower growth in the euro area, Germany, France, Italy, UK, US, Japan, Turkey, and Korea, whereas it stimulates growth in Canada, Australia, Argentina, Mexico, China, India, and South Africa. However, a simultaneous decline in the wage share in all these countries leads to a decline in global growth. Furthermore, Canada, Argentina, Mexico, and India also contract when they decrease their wage-share along with their trading partners.

Keywords: wage share, growth, global multiplier, consumption, investment, exports, imports, G20, developed and developing countries

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1. Introduction

There has been a significant decline in the share of wages in GDP in both the developed and developing countries following the 1980s. The reasons for this fall have recently been the subject of a growing amount of literature trying to pin down the effects of technology, globalization, and changes in labour market institutions (e.g., IMF, 2007; OECD, 2007; EC, 2007; ILO, 2011; Rodrik, 1997; Diwan, 2001; Harrison, 2002; Onaran, 2009; Rodriguez and Jayadev, 2010; Stockhammer, 2011). This paper aims at estimating the effects of this change in income distribution on growth at a national and global level.

The theoretical framework of the paper is based on the Post-Keynesian idea that wages have a dual role; they are both a component of cost as well as a source of demand. The theoretical models developed by Rowthorn (1981), Dutt (1984), Taylor (1985), Blecker (1989), Bhaduri and Marglin (1990) reflect this dual role by examining the direct positive effects of lower wages/higher profits on investment and net exports as well as their negative effects on consumption. In these models, consumption is expected to decrease when the wage share decreases as long as the marginal propensity to consume out of capital income is lower than that out of wage income. A higher profitability (a lower wage share) is expected to stimulate investment for a given level of aggregate demand. Also internal funds are an important source of finance and thus profits may positively influence investment expenditures. Finally, for a given level of domestic and foreign demand, net exports will depend negatively on unit labour costs, which are, by definition, closely related to the wage share. Thus, the total effect of the decrease in the wage share on aggregate demand depends on the relative size of the effects of changes in income distribution on consumption, investment and net exports. If the total effect is negative, the demand regime is called wage-led; otherwise the regime is profit-led. Whether the negative effect of lower wages on consumption or the positive effect on investment and net exports is larger in absolute value essentially becomes an empirical question.

We first estimate the effect of the share of wages in income on aggregate demand in the major developed and developing countries (sixteen G20 countries, for which data is available); these constitute more than 80% of the global GDP. These are rather different countries structurally and the effects of income distribution on consumption, investment, and net exports crucially depend on the institutions in each country. Therefore, we estimate country specific equations to find the effect of income distribution on each component of private aggregate demand (i.e., consumption, investment, and net exports) and develop a global mapping of demand regimes in different countries. The economies in which the responsiveness of investment to profits is rather strong and foreign trade is an important part of the economy (as it is the case in small open economies) are more likely to have profit-led demand regimes. The first contribution of the paper is the global focus due to the inclusion of the major developing countries. Most of the previous empirical work on the effects of income distribution on growth has focused on developed countries (e.g., Onaran, et al, 2011; Stockhammer, et al, 2011; Stockhammer and Stehrer, 2011; Stockhammer, et al, 2009; Hein and Vogel, 2008; Naastepad and Storm, 2007; Ederer and Stockhammer, 2007; and Bowles and Boyer, 1995) with only a few notable exceptions on developing countries (i.e., Molero Simarro, 2011 and Wang, 2009 on China; Jetin and Kurt, 2011 on Thailand; Onaran and Stockhammer, 2005 on South Korea and Turkey). Dutt (1996 and 2010) discusses the relevance of models emphasizing the role of aggregate demand and income distribution for the developing countries; this is important irrespective of the context of the constraints of capital and infrastructural shortages, balance of payments or fiscal problems, and stagnant agricultural sectors found in these countries.

The second and most important contribution of the paper is that it goes beyond the nation state as the unit of analysis and develops a global model to analyze the interactions among different economies. We calculate a global multiplier based on the responses of each country to changes not only in domestic income distribution but also to trade partners' wage share; this in turn

affects the import prices and foreign demand for each country. The crucial question is what happens to global demand when there is a simultaneous decline in the wage share in all major developed and developing economies as has been the case in the post-1980s period. A related question is whether countries that are profit-led in isolation, would stop growing, or even contract, if all other countries were experiencing a similar decline in the wage share simultaneously. We test empirically to ascertain whether the gains in competitiveness will be lost in individual countries if there is a simultaneous decline in unit labour costs in their trade partners. To the best of our knowledge, this paper is the first in the theoretical, as well as the empirical, literature to develop a model of the global effects of changes in income distribution as opposed to focusing on isolated single country effects.

The rest of the paper is organized as follows: section two discusses data issues and stylized facts. Sections three and four present the estimation methodology and the empirical results of our model. Section five compares our results with previous findings in the literature. Section six calculates the national and global multiplier effects of a simultaneous decrease in the wage share. Finally, Section seven concludes and derives policy implications.

2. Data and stylized facts

Our aim in this paper is to present a representative analysis for the global economy. Therefore, we focus on the sixteen major developed and developing countries, which are members of G20: European Union, Germany, France, Italy, UK, US, Japan, Canada, Australia, Turkey, Mexico, South Korea (henceforth Korea), Argentina, China, India, and South Africa.[1] Instead of the EU, we work with the 12 West European Member States of the euro area, since data for the

[1] Among the G20 countries, there is no wage share data for Saudi Arabia. Wage share data for Brazil starts only in 1990 and for Russia in 1989. This is insufficient for reliable time series estimations. In Indonesia, the wage share data exists only for the manufacturing industry; there are no national accounts data based upon income. Therefore these countries could not be included in the analysis.

Eastern European new member states does not exist prior to transition.[2] Estimations are made separately for the UK, which is the largest old member state outside the euro area.

Appendix A describes the data sources in more detail. The estimation period is 1960-2007 for the developed countries, and 1970-2007 for the developing countries (1978-2007 for China). The period of the crisis (i.e., 2008-09) are excluded, since it would be impossible to test for possible structural breaks with only two observations since the crisis. Moreover, 2009 data is still provisional at the time of the analysis.

C, I, X, M, Y, W and R are real consumption expenditures, real private investment expenditures, real exports (of goods and services), real imports (of goods and services), real GDP (at market prices), real wages and profits respectively. For econometric reasons all variables are in logarithmic form.[3]

Wages are adjusted labour compensation, calculated as real compensation per employee multiplied by total employment. In the national accounts, all income of the self-employed are classified as operating surplus. However, since part of this mixed income is a return to the labour of the self-employed, the simple (unadjusted) share of labour compensation in GDP underestimates the labour share. This is a particular problem for the developing countries that have a significant share of self-employed workers due to the informal nature of employment. Thus the adjusted wage share allocates a labour compensation for each self-employed person equivalent to the average compensation of the dependent employees.[4] Profit is also adjusted gross operating surplus, calculated as GDP at factor cost minus adjusted labour

[2] The euro area is treated as one unit in the estimations; this is so even for the period prior to monetary unification. It is thus assumed that a behavioral function can reasonably be reconstructed for the 1960s, for example. Previous work by Stockhammer, et al (2009) show that Chow tests and experimentation with dummy variables (around the times of EU extensions) were usually not statistically significant and did not alter results substantially. Thus it seems that, at least statistically, the euro area can be treated as one area prior to its coming into existence.

[3] As the variables exhibit exponential growth, the variance of the level of the respective variable increases over time. In logarithms this problem disappears.

[4] This methodology is used by the OECD and AMECO for calculating adjusted labor share. See Gollin (2002) for more details about the methodology.

compensation.[5] Profit share, π, is defined as adjusted gross operating surplus as a ratio to GDP at factor cost. Wage share, ws, is simply 1- π; thus it is adjusted labour compensation as a ratio to GDP at factor cost.

There are several data issues regarding the wage share in the developing countries: The wages of the self-employed, who to a large extent are working in the informal economy, would be significantly lower than the average wage in the formal economy. Despite these problems associated with the lack of precise data regarding the labour income of the self-employed, we prefer to work with the adjusted wage share. Ignoring the labour income of the self-employed, which constitute a significant part of the labour force in the informal economy, would mean a serious underestimation of the labour income in the developing countries. Due to lack of long time series data for the number of self-employed we link the data for the unadjusted wage share with the adjusted wage share data for Argentina and South Africa.[6] For China, we use the adjusted wage share data calculated by Zhou, et al. (2010), which is reported in Molero Simarro (2011)[7]. In India there is no time series data for the number of employees (and self-employed). However, there is data for the mixed income of the self-employed which can be used to calculate adjusted wage share.[8] Gollin (2002) suggests two methods of adjustment using mixed income data: the first method calculates the adjusted wage share as labour compensation as a ratio to GDP at factor cost-mixed income and the second method calculates (labour compensation+mixed income)/GDP at factor cost. Both methods are not perfect, and following

[5] GDP at factor cost is GDP at market prices minus taxes on production and imports plus subsidies. It is equal to the summation of labor compensation and operating surplus in the national accounts.

[6] For Argentina, we use the percentage change in the unadjusted wage share data in Lindenbaum, *et al* (2011) for 1970-92 and 2006-07 to extend the adjusted wage share data in Charpe (2011) for 1993-2005. Similarly, for South Africa we link the unadjusted wage share data in the UN National Accounts for 1970-88 and 2005-07 with the adjusted wage share data in Charpe (2011) for 1989-2004.

[7] Zhou, *et al* (2010) report that in the national accounts data of the National Bureau of Statistics "proprietors' income is considered as labor's compensation" before 2004; after 2004 "labor's compensation and operating profits of the proprietors are considered as business profits". Zhou, *et al* (2010) correct the problem resulting from this discontinuity in the data by adjusting the wage share after 2004 using self-employment data.

[8] However this data is available only until 1999; for 2000-07 we use estimated mixed income based on the sectoral mixed income shares in 1999. We are grateful to Uma Rani Amara for providing the calculations for the mixed income estimates for 2000-07 based on the sectoral mixed income shares in 1999.

Felipe and Sipin (2004) and Jetin and Kurt (2011) we use the average of these two adjusted wage shares.

Figure 1 shows the indices of the adjusted wage share in the developed (1960=100) and developing countries (1970=100).[9] There is a secular decline in the wage share in all countries starting from late 1970s or early 1980s onwards. This downward trend also exists in the unadjusted wage share. In the developed world the decline is particularly strong in the euro area, as well as in the three large economies of the euro area- France, Germany, and Italy, and in Japan with a fall exceeding 15%-points in the index value. The fall is lower, but still strong, in the US and UK with a decline of 8.9% and 11.1% respectively.[10]

[Figure 1]

In the developing world, Turkey and Mexico have experienced the strongest decline in the wage share (31.8% and 37.9% respectively); this is particularly so during the debt crisis, the initial phases of structural adjustment and the currency crises of the 1990s and 2000s. These events also mark the turning points in the wage share in Argentina, where hyperinflation episodes add an additional element of high volatility. In Argentina there has been a recovery in the wage share after the crisis of 2001; whereas in both Mexico and Turkey, the wage share remained lower than the pre-crisis levels. In Korea, the increase in the wage share from mid-1980s onwards was also reversed by the crisis in 1997. In India, the secular decline in the wage share since the 1970s has accelerated after 1990; as of 2007 the wage share index is 17.6% lower as compared to 1980. In China the improvement in the wage share in the 1980s was

[9] We prefer to convert the values of the wage share to indices in order to be able to compare the trends and avoid the differences in the levels of the wage share due to methodological differences among the countries in calculating the adjusted wage share.
[10] A correction of the wage share by excluding the high managerial wages that have increased very steeply in these countries would have provided a more detailed picture about the decline in the wage share. However, with the exception of the US and UK, there is a lack of data on managerial wages for the majority of the countries in our sample; as a result, this adjustment is outside the scope of this paper.

reversed in 1990 culminating in a cumulative decline of 12.8% in the index value. The wage share in South Africa has been decreasing since the early 1980s resulting in a decline of 18.2%.

How did the growth of GDP perform during these two to three decades of decline in the wage share? Table 1a and 1b show the average growth rates in GDP in different periods for the developed and developing countries. In the developed countries, the decline in the wage share was associated with a weaker growth performance in each decade compared to the previous decade in almost all cases. With the exception of China and India, all countries in the developing world in the post-1980s period have lower growth rates as compared to the 1970s. With the exception of the last decade, in Turkey and South Africa there is a continuous deterioration in the growth performance along with the fall in the wage share. In Korea, the declining wage share since the Asian crisis also corresponds to a clear decline in growth rates. The earlier decline in the wage share coincides with very weak growth performance during the lost decade of the 1980s in Mexico and Argentina. However, while growth recovers in the post-1990s, the wage share does not; thus the direction of the relationship is unclear. In both China and India a strengthening of growth is observed along with falling wage share.

[Table 1a]

[Table 1b]

3. Estimation methodology

We analyze the effects of the changes in the wage share on growth by means of estimating single equations for consumption, investment, exports, and imports. There are two major qualifications concerning the methodology. First, functional income distribution is assumed to be exogenous. Endogenising income distribution is not feasible in the absence of good instrumental variables and long time series data. Second, the paper uses the single equation

approach widely used in the literature (e.g., Onaran, et al, 2011; Stockhammer, et al, 2009; Hein and Vogel, 2008; Naastepad and Storm, 2007). The single equation approach fails to utilize the fact that consumption, investment and net exports (and state expenditures) add up to GDP. To address this aspect as well as the endogeneity of the wage share, a systems approach, like the VAR approach used by Stockhammer and Onaran (2004) and Onaran and Stockhammer (2005), may be a solution. However, this comes with its own problems because results are more difficult to interpret. It is not possible to detect the precise economic relationships that lead to changes in demand in response to distribution when using the systems approach. Nevertheless, it is important to note that the convenience of interpretation of the results of the single equation approach come at the price of some bias because the system-dimension is ignored.

Unit root tests suggest that most of our variables are integrated of order one. Following standard practice in modern econometric modelling, error-correction models (ECM) are applied wherever feasible. Where there was no indication of cointegration, specifications in difference form are estimated. π is I(1) in all countries except for the UK, Italy, Turkey, and Argentina. For these countries, we use the level of π, and for the others we test for ECM and use the difference specification if there is no cointegration.

We start with a general specification with both the contemporaneous values and first lags of the variables as well as a lagged dependent variable. Except for those cases where we encounter autocorrelation problems, the specification with only significant values is chosen. We tested for serial correlation using Breusch-Godfrey test. Wherever autocorrelation persists, either the lagged dependent variable is kept (even when it was insignificant in order to prevent autocorrelation problems), or if the problem still persists an AR(1) term is added. Variables relating to the effect of distribution (wage share, profit share, or unit labour costs) in the

specifications were kept even if they were insignificant to illustrate the lack of a statistically significant effect; however, they were treated as statistically equal to zero.

In the ECM specifications, long-term elasticities are calculated by dividing the statistically significant coefficient of the lagged log-level of the explanatory variable by the negation of the speed of adjustment coefficient. In the difference specifications, long-term elasticities are calculated by adding up the coefficients of the contemporaneous and lagged variable (if they are statistically significant) divided by 1- the coefficient of the lagged dependent variable (if it is statistically significant).

4. Estimation Results

4.1 Consumption

Consumption, C, is estimated as a function of adjusted profits, R, and adjusted wages, W (all in logarithms and deflated by the GDP deflator):

$$C = c_o + c_r R + c_w W \qquad (1)$$

This closely resembles standard consumption functions except that income is split into wage and profit income. Elasticities are converted into marginal effects at the mean of our sample by multiplying the estimated coefficients (elasticity) of R and W by C/R and C/W respectively:

$$\frac{\partial C/Y}{\partial R/Y} = c_R \frac{C}{R} - c_W \frac{C}{W} \qquad (2)$$

The difference in marginal consumption propensities (out of profit and wage incomes) gives the effect of a change in the profit share.

In the case of the developing countries, we also test whether the difference in the marginal consumption propensities out of wages and profits differs between rural and urban regions. In the revised estimations, we augment Equation (1) with the agricultural GDP, Y_a:[11]

$$C = c_o + (c_a - c_u)Y_a + c_{wu}W + c_{ru}R \qquad (3)$$

where c_{wu} and c_{ru} are the marginal propensities to consume out of wages and profits in urban regions, $(c_a - c_u)$ is the differences between marginal propensity to consume in the rural and urban regions, which is assumed to be the same for both profit and wage income. The share of agriculture in GDP is $a=Y_a/Y$. In this revised model the marginal effect of a change in the profit share on C/Y is

$$\frac{\partial C/Y}{\partial R/Y} = c_{ru}\frac{C}{R} - c_{wu}\frac{C}{W} + a(c_a - c_u)\left(\frac{C}{R} - \frac{C}{W}\right) \qquad (4)$$

Note that the first two terms give the standard difference in marginal propensities to consume as described in Equation 2, and the last term incorporates the difference between the rural and urban regions.[12]

The ECM specification does not give statistically significant cointegration coefficients for the long run effects. A specification in differences is estimated for all countries. The estimations results are in Tables 2. In cases where either of the lags of W or R is significant, we also kept the insignificant lag of the other variable, since theoretically the sum of W and R in any period gives the total income in that period, and they are jointly significant.

[Table 2]

The coefficient of Y_a is significant only in the case of India and South Africa; therefore for other countries we report only the estimations without Y_a.[13]

[11] See Appendix B for the details.
[12] The derivation of this revised equation for consumption is available upon request.
[13] In India both the current and lagged values of all variables were kept, since lagged Y_a was significant, although current Y_a was not. However, theoretically since the contemporary values of W and R are significant, we also have to keep the contemporary value of Y_a in the equation in order to account for the rural wage and profit income. Similarly since the lagged

The hypothesis that consumption propensities vary between profit and wage income is confirmed in all countries. Table 3 reports the differences in the marginal effects of R and W (i.e., the differences in the consumption propensities) calculated as described in Equation (2) for the basic specification, and for the specifications accounting for urban and rural differences as described in Equation (4) for India and South Africa. The marginal propensity to consume out of profits is lower than that out of wages in all countries; thus a rise in the profit share leads to a decline in consumption. This finding is consistent with the previous empirical research.[14]

[Table 3]

In the case of India, the specification with Y_a estimates a difference in the marginal propensity to consume out of profits and wages of -0.29. The specification, where Y_a is not included, gives a difference in the marginal propensities to consume of -0.22. Even the corrected difference in the marginal propensities to consume reflecting the urban-rural differences is rather on the lower bound of the estimates in the developed as well as the developing countries.

The differences in the marginal propensity to consume out of profits and wages are rather low in Argentina and South Africa (-0.15 and -0.14). In South Africa, Y_a is significant, but its inclusion does not change the magnitude of the marginal propensities substantially. The difference is larger (in absolute values) in South Africa if the equation is estimated for the post-apartheid era (0.33); however with only 9 degrees of freedom an estimation for the period after

value of Y_a was significant, we did not drop the lagged W and R even though they were insignificant, in order to account for the lagged values of wages and profits in the rural regions.

[14] See Onaran, *et al.* (2011), Stockhammer *et al*. (2011), Stockhammer and Stehrer (2011), Stockhammer, *et al.* (2009), Hein and Vogel (2008), Naastepad and Storm (2007), Ederer and Stockhammer (2007), Bowles and Boyer (1995), Molero Simarro (2011), Wang (2009). The findings for savings or consumption rates for different personal income groups also point in a similar direction: *e.g.*, in China, Wang (2010) reports the results of a survey, which show significant differences in marginal propensity to consume for different income groups: the respondents earning less than Rmb7,000 per capita in 2008 spend more than their income (*i.e.*, negative savings), while those earning Rmb7,001-10,000 have a savings ratio of only 8.8%, and the highest income group earning over Rmb400,000 has a much higher savings ratio at 63.4%. Qin, *et al* (2009) find a negative effect of rising personal and rural-urban income inequality on consumption as well as macro-economic stability and consequently investment.

1995 can only be indicative at best. In Argentina, we have not been able to find a change in the parameters estimated through time.

4.2 Investment

Private investment is modelled as a positive function of output using a standard accelerator effect and the profit share as a proxy for expected profitability as well as the availability of internal finance. Thus private investment, I, is expressed as

$$I = i_A + i_Y Y + i_\pi \pi \qquad (5)$$

where i_A is autonomous investment, and all parameters are expected to be positive.

The long-term real interest rate variable is not statistically significant and therefore excluded.

In the case of developing countries, we also add the agricultural GDP in the estimations in order to account for the possible differences in investment behaviour in the agricultural industry (in logarithmic difference as well as log-levels in specifications with ECM). Assuming that π is the same in both the agricultural and non-agricultural industry, total I can be written as

$$I = i_A + i_{Yu} Y_u + i_{Ya} Y_a + (i_{\pi a} + i_{\pi u})\pi \qquad (6)$$

where $Y_a = aY$ as defined above and $Y_u = (1 - a)Y$; thus

$$I = i_A + i_{Yu} Y + (i_{Ya} - i_{Yu}) Y_a + i_\pi \pi \qquad (7)$$

where the coefficient of Y_a in the equation reflects the difference in the accelerator effects in agriculture and non-agricultural industries. It is expected to be negative given the lower capital

intensity in agricultural production. Y_a has been kept in the reported specifications only if it is statistically significant.

In order to reflect the possible crowding-in or crowding-out effects of government investments, public investment, Ig, was added to the specifications, and kept wherever significant.

The ECM specification is significant only in the case of the euro area, Germany, the UK, Mexico, and Argentina.[15] In the UK and Argentina, since π is not I(1), the ECM vector includes only I and Y; π enters the specification as its level rather than in its difference form. For the other countries simple difference specifications are estimated.[16] In Italy and Turkey π is used in its level form in the difference specifications, since it is not I(1).[17] The results are summarized in Table 4.

[Table 4]

The US is the only developed country where the profit share has no significant effect on investment. This is consistent with the findings in Hein and Vogel (2008). However, although gross operating surplus has no significant effect on investment in the US, Onaran, et al. (2011) show that when the interest and dividend payments are deducted from the operating surplus there is evidence of some positive effect of the revised profit share on investment. Thus the increase in interest and dividend payments leads to an insignificant effect of the gross operating surplus on investment.

Interestingly, in many developing countries the profit share has no statistically significant effect on private investments; we find a positive effect only in Mexico, Argentina,

[15] We use the t-ratios reported by Banerjee *et al.* (1998) for the speed of adjustment coefficient to test the significance of a cointegration relationship.
[16] We also estimate specifications, where we test for cointegration only between Y and I (and in alternative specifications with Y_a and I_g in the ECM vector).
[17] For the UK, Italy, Argentina, and Turkey specifications, which treat π as I(1) and find no significant effects of profits upon private investment.

and South Africa. The effect of the profit share on private investment in China is also insignificant, although there is a positive effect on total investment including public investment.[18] In the other countries (Turkey, Korea, India) where there is no statistically significant effect of the profit share on private investment, total investment also is not significantly related to the profit share. The lack of evidence for a positive effect of profits on investment is consistent with the previous findings in the literature on developing countries: Onaran and Yentürk (2001) fail to find a statistically significant effect of the profit share on private investment in the Turkish manufacturing industry using panel data. Seguino (1999) even finds a negative effect of the profit share on investment in the manufacturing industry in Korea. Based on systems estimations using a SVAR model, Onaran and Stockhammer (2005) find a negative effect of the profit share on private investment in both Turkey and Korea. However these results are not readily comparable to ours; they are based on impulse responses and should be interpreted as the cumulative effect of changes in GDP as well as profitability rather than the partial effect of the profit share.

In all countries, GDP has a strong and significant effect on private investment, providing evidence for the significance of an investment-growth nexus. Furthermore, in three developing countries (Korea, India, and China) public investment has a significant positive effect on private investment which indicates the presence of crowding-in effects. However, the aggregate public investment figures do not reflect the complexity of industrial policies or the composition of public of public spending; therefore the results are not a precise test of the more complicated mechanisms of crowding-in.

[18] Molero Simarro (2011) and Wang (2009) both estimate the effect of profit share on total investment and find a positive effect. The aim of this paper is to identify the effect of income distribution on private aggregate demand; state owned firms act with different policy objectives, although increasing profits would increase the internal funds available for their investment as well. However, it makes no sense to treat these units as part of the same behavioral function as private investment. Private investment in China is calculated as total investment minus investment by state owned and collective owned units. However, it is appropriate to note a data problem here: our profit share variable is not specific to the private enterprises; thus we assume that the share of operating surplus/value added is the same in the privately owned and state (or collective) owned units. If the relative profit shares in these different firms are changing over time, our specifications would fail to reflect this change.

Even in the East Asian countries like Korea and China that have high investment rates, private investment is not driven by high profits. The importance of the business environment created by industrial policy and public investment may explain the lack of statistically significant correlation between private investment and profits. In the East Asian countries, industrial policy instruments boosted profitability above the free-market levels and encouraged investment; this holds both at the general level and targeted at selected industries (Akyüz, et al., 1998). A sustained and predictable increase in wages rather than low wages has been important in maintaining high demand and high accumulation in Korea (Amsden, 1989; Seguino, 1999). East Asian governments have managed to coordinate complementary investments and create a "big-push" to deal with significant scale economies and capital market imperfections (Storm and Naastepad, 2005; Akyüz, et al., 1998). Rao and Dutt (2006) argue that increased infrastructure investment in transport and energy was one of the major factors behind India's strong growth performance in the 1980s, which crowded-in private investment and created a positive supply-side effect.

Agricultural GDP is significant only in the case of South Africa, and had a negative coefficient as expected.

Table 5 reports the marginal effects, where elasticities (long term coefficients) are converted to the marginal effects of π on I/Y at the sample mean:

$$\frac{\partial I/Y}{\partial R/Y} = i_{\pi} \frac{I}{R}. \qquad (8)$$

[Table 5]

4.3 Net exports

To estimate the effects of distribution on net exports we follow the stepwise approach of Stockhammer, et al. (2009) and Onaran, *et al.* (2011). We estimate exports (X) as a function of export/import prices (P_x/P_m) and the GDP of the rest of the world (Y_{rw}); imports (M) as a function of domestic prices/import prices (P/P_m) and GDP; domestic prices (P) and export prices (P_x) as functions of nominal unit labour cost (ulc) and import prices (P_m). The exchange rate is included in export and import estimations if it is significant. ECM specifications are used wherever significant; otherwise specifications are estimated in differences.

In Turkey, Mexico, and South Africa there are no significant effect of export prices on exports; so we attempt a direct estimation strategy by estimating exports as a function of real unit labour costs, rulc. In South Africa there were no significant effects again. In Turkey and Mexico, exports were negatively affected by real unit labour costs. In these two countries we use the estimated coefficients of real unit labour costs in the price equations to reiterate the elasticities of exports to export prices. In South Africa, there is also no significant effect of unit labour costs on export prices. In the euro area[19] and Germany there are no significant effect of either prices or real unit labour costs on imports. The estimation results are in Tables 6-9.

[Table 6]

[Table 7]

[Table 8]

[Table 9]

Using the estimated elasticities, we calculate the marginal effect of a change in the wage share on exports/GDP and imports/GDP at the sample average. The wage share is closely related to

[19] Unfortunately export and import data for extra-euro area trade only exists for goods, but not for services. Thus all estimations for the euro area had to be performed for trade in goods only.

real unit labour cost. The rulc is adjusted labour compensation divided by GDP in market prices; thus it is equal to the wage share in our model times GDP at factor cost as a ratio to GDP in market prices. Nominal unit labour cost, ulc, is simply rulc times the domestic price deflator, P. The total effect of a change in the wage share on exports includes the effect of real unit labour cost on nominal unit labour cost, the effect of nominal unit labour costs on prices, the effect of prices on export prices, and the effect of export prices on exports.

The effect of real unit labour cost on nominal unit labour cost is given as follows:

$$\frac{\partial \ln ulc}{\partial \ln rulc} = \frac{1}{1-\beta_{ulc}} \tag{9}$$

where β_{ulc} is the effect of ulc on domestic prices.

Then the chain derivative below shows the marginal effect of the wage share on X/Y:

$$\frac{\partial X/Y}{\partial (ws)} = \left(\frac{\partial X}{\partial P_x}\frac{\partial P_x}{\partial (ulc)}\frac{\partial (ulc)}{\partial (rulc)}\frac{\partial (rulc)}{\partial (ws)}\right)\frac{X/Y}{rulc}$$
$$= \left(e_{XP_x} e_{P_xULC}\frac{1}{1-e_{PULC}}\frac{Yf}{Y}\right)\frac{X/Y}{rulc} \tag{11}$$

where e_{P_xULC} is the effect of ulc on export prices, and e_{XP_x} is the effect of export prices on exports. The average values of $\frac{X/Y}{rulc}$ for the total sample mean are used to convert the elasticity to marginal effect. In Table 10 the components of this chain derivative are shown based upon the estimated long-run elasticities in Tables 6-9, and the total effect of an increase in the profit share is summarized; thus the above derivative is multiplied by -1, since the effect of an increase in the profit share is the inverse of the effect of an increase in the wage share.

A similar procedure is followed for imports:

$$\frac{\partial M/Y}{\partial(ws)} = \left(\frac{\partial M}{\partial P}\frac{\partial P}{\partial(ulc)}\frac{\partial(ulc)}{\partial(rulc)}\frac{\partial(rulc)}{\partial(ws)}\right)\frac{M/Y}{rulc}$$
$$= \left(e_{MP}e_{PULC}\frac{1}{1-e_{PULC}}\frac{Yf}{Y}\right)\frac{M/Y}{rulc}$$

(12)

[Table 10]

The effect of the wage share on GDP via the channel of international trade not only depends on the elasticity of exports and imports to prices. It also depends on the degree of openness of the economy (i.e., on the share of exports and imports in GDP); to reflect this we convert elasticities to marginal effects using X/Y and M/Y. Thus in relatively small open economies net exports may play a major role in determining the overall outcome; the effect becomes much lower in relatively closed large economies.

The net export effect in China is notable as it is extremely high: a 1%-point increase in the profit share leads to an increase of 1.1%-point in exports as a ratio to GDP and a decline of 0.9%-point in imports as a ratio to GDP. These high effects are related to several factors: First, the elasticity of prices to unit labour costs is the highest in the world (0.77), indicating a highly labour intensive export structure with also 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, e.g., consumer goods like textiles. Finally, the price elasticity of imports is the second highest in the world after South Africa (0.79).

In Australia, Turkey, and India, the income elasticity of exports is insignificant. For the latter two countries, this is consistent with the structuralist economists' arguments that developing countries' exports have low income elasticity (Singer, 1998). However, this is not the case in the other developing countries under examination.

4.4 Total effects

Table 11 summarizes the partial effects of a 1%-point increase in the profit share on consumption, investment, and net exports based on Tables 3, 5, and 10, and reports the total effect in column 4. This is prior to the multiplier process, i.e., before further effects of changes in national income on investment, consumption, and imports. We will call the sum of the partial effects of distribution on demand prior to the multiplier effects the effect on private excess demand. In Section 6 below the multiplier is calculated and the total effects on aggregate demand are presented.

Before we discuss which countries are wage-led or profit-led, it is appropriate to emphasize one important and robust finding: if we sum up only the effects on domestic private demand (i.e., consumption and investment) the negative effect of the increase in the profit share on private consumption is substantially larger than the positive effect on investment in absolute value in all countries. Thus demand in the domestic sector of the economies is clearly wage-led; however, the foreign sector then has a crucial role in determining whether the economy is profit-led.

[Table 11]

Overall demand in the euro area (12 countries) is significantly wage-led; a 1%-point increase in the profit share leads to a 0.08% decrease in private excess demand. Unsurprisingly, Germany, France, and Italy as individual large member states of the Euro area are also wage-led. The absolute value of the effect of an increase in the profit share in Germany and France is smaller than in the aggregate euro area; the net export effects are higher for the individual countries with a much higher export and import share in GDP due to trade with the other euro area countries as well as non-euro area countries. Previous studies show that small open economies in the euro area, like the Netherlands and Austria, may be profit-led when analyzed

in isolation (Hein and Vogel 2008; Stockhammer and Ederer, 2008). However, the aggregated euro area is a rather closed economy with a low extra-EU trade albeit a high intra-EU trade in which overall demand is wage-led. Thus wage moderation in the euro area as a whole is likely to have only moderate effects on foreign trade, but it will have substantial negative effects on domestic demand. Second, if wages were to change simultaneously in all euro area countries, the net export position of each country would change little because extra-euro area trade is comparatively small. Thus, when all euro area countries pursue a similar policy of international competitiveness based on decreasing unit labour costs, the international competitiveness effects will be minor, and the domestic effects will dominate the outcome.

The UK, US, and Japan are also wage-led; albeit the effect varies depending on the degree of openness of the economy as well as the relative strength of the consumption differentials and investment's response to profits. Overall the results indicate that large/relatively closed economies are rather wage-led than profit-led. Canada and Australia are profit-led; as small open economies the net export effects are high; the investment effects are also among the highest in the developed world in these two countries, and the differences in the marginal propensity to consume out of profits and wages are among the lowest.

Among the developing countries, only Turkey and Korea are wage-led; consumption effects are very strong and more than offset the rather strong net export effects; there is no significant effect of profits on investment in either of the two countries. China is very strongly profit-led with an unusually high distributional effect: a 1%-point increase in the profit share increases private excess demand by 1.57%; however this effect is not due to investment, but rather results from the very strong export and import effects discussed above. South Africa is also profit-led with a relatively high impact of distribution; this is partly related to a very low difference in the marginal propensity to consume out of profits and wages, which may have increased in the period after apartheid as discussed in Section 4.1. Mexico and Argentina also

have a profit-led private demand regime; in Mexico a strong effect of profits on both investment and net exports, and in Argentina a weak effect on consumption explain the results. India is profit-led but the effect of distribution is rather low; a high net export effect slightly offsets the rather low effect on consumption, and the effect on investment is insignificant.

5. Comparison with the literature

In this section we compare our country specific results about the nature of the demand regime with the previous empirical literature. Consistent with our findings, previous findings for the individual countries in the literature also mostly conclude that domestic demand is wage-led.[20]

In most of the developed country cases analyzed in the previous literature, the addition of the foreign demand does not reverse the results with regards to the nature of aggregate private demand. Our results are consistent with Stockhammer, et al. (2009) for the euro area; Stockhammer, et al. (2011), Hein and Vogel (2008), and Naastepad and Storm (2007) for Germany; Hein and Vogel (2008), and Naastepad and Storm (2007) for France and Italy; Hein and Vogel (2008), Naastepad and Storm (2007), and Bowles and Boyer (1995) for the UK; with Onaran, et al. (2011), Hein and Vogel (2008), and Bowles and Boyer (1995) for the US, who find evidence of wage-led private demand in these countries. Ederer and Stockhammer (2007) report a wider range of specifications for France, some of which indicate a profit-led demand regime. Bowles and Boyer (1995) find profit-led regimes in Germany, France, and Japan, but their results suffer from econometric problems such as unit root issues; they do not apply difference or error correction specifications. Naastepad and Storm (2007) find profit-led demand regimes in the US and Japan, but these results are driven by the unconventional finding

[20] See Stockhammer, *et al* (2009) for the Euro area; Onaran, *et al* (2011) for the US; Stockhammer and Stehrer (2011) for Germany, France, US, Japan, Canada, Australia; Naastepad and Storm (2007) for Germany, France, Italy, UK; Hein and Vogel (2008) for Germany, France, UK, US; Bowles and Boyer (1995) for Germany, France, UK, US, Japan; Stockhammer, *et al* (2011) for Germany and Ederer and Stockhammer (2007) for France.

that the domestic demand regime is profit-led in these countries. These results are rather different from other findings in the literature for these countries as well as ours. Using a different methodology, Stockhammer and Onaran (2004) estimate a structural Vector Autoregression (VAR) model for the US, UK and France, where they conclude that the impact of income distribution on demand and employment is very weak and statistically insignificant. Although VAR does well in dealing with simultaneity, it is weak in identifying the effects and individual behavioural equations; thus it is hard to compare their results with ours. Again using VAR methodology Barbosa-Filho and Taylor (2006) find that the US economy is profit-led; however their estimations suffer from autocorrelation issues.[21] There are no previous studies on the character of the aggregate demand regime in Australia and Canada.

The empirical studies on the effects of distribution on demand in the developing countries are remarkably limited. Onaran and Stockhammer (2005) find that Turkey and Korea are both wage-led. Molero Simarro (2011) estimates the effects of distribution on domestic demand in China, and Wang (2009) estimates the effects on aggregate demand using regional panel data for China. Both studies use the econometric methodology in Stockhammer, et al (2009). In both studies investment also includes public investment and they find a positive effect on investment, and thereby a strongly profit-led domestic, as well as aggregate, demand; however this does not tell us much about the private investment behaviour. Looking only at consumption and private investment, we find that domestic demand is wage-led in China, although aggregate demand including net exports is profit-led. Using a similar methodology to the one used in this paper, Jetin and Kurt (2011) find that private demand in Thailand is profit-led. To the best of our knowledge, there is no econometric analysis on the effect of functional income distribution on growth in Mexico, Argentina, India, and South Africa.

[21] See Stockhammer and Stehrer (2011) for an extensive methodological critique of Barbosa-Filho and Taylor (2006).

6. National and global multiplier effects

In this section we calculate the multiplier effects of the change in private excess demand on equilibrium aggregate demand. We start with the national multiplier effects in isolation, i.e., still assuming that the change is taking place only in one single country, and ignore any further feedbacks from the effects on the GDP of the trading partners.

In our case the initial change in demand is caused by a change in income distribution. However, this initial change in demand will lead to a multiplier mechanism, that is it will, affect consumption, investment, and imports. Thus in order to find the total effects of a change in income distribution on equilibrium aggregate demand, private excess demand has to be multiplied by the standard multiplier:

$$\frac{dY^* / Y}{d\pi} = \frac{\left(\frac{\partial C / Y}{\partial \pi} + \frac{\partial I / Y}{\partial \pi} + \frac{\partial NX / Y}{\partial \pi} \right)}{1 - \left(\frac{\partial C}{\partial Y} + \frac{\partial I}{\partial Y} - \frac{\partial M}{\partial Y} \right)} \qquad (13)$$

The numerator is private excess demand, that is, the change in private demand caused by a change in income distribution for a given level of income, as it is reported in Table 11. The term $1/(1-\left(\frac{\partial C}{\partial Y} + \frac{\partial I}{\partial Y} - \frac{\partial M}{\partial Y} \right))$ in the Equation (13) above is the standard multiplier and has to be positive for stability. The multiplier consists of the partial effects of changes in income on consumption, investment, and imports. The coefficient estimates in Tables 2, 4, and 9 give the elasticities of C, I, and M with respect to Y; again these have to be converted into partial effects:

$$\mathrm{H} = \frac{\partial C}{\partial Y} + \frac{\partial I}{\partial Y} - \frac{\partial M}{\partial Y} = e_{CY} \frac{C}{Y} + e_{YI} \frac{I}{Y} - e_{MY} \frac{M}{Y}. \qquad (14)$$

Table 12 shows these elasticities and the multiplier for each country.[22] The multiplier is larger than one in all cases; thus when the multiplier effects are taken into consideration the effect of a change in income distribution on aggregate demand becomes higher.

[Table 12]

Until now, the unit of analysis has been the nation state or a single economic area in isolation. Next we analyze the global multiplier effects of a simultaneous 1%-point decrease in the wage share in all the thirteen large developed and developing economies.[23] This global multiplier mechanism incorporates the effects of a change in the profit share of other countries on the aggregate demand of each economy; as such it adds the effects of changes in imports prices and the GDP of trade partners on top of the national multiplier effects. For the case of n countries, the vector of the percentage change in the GDP of each country, $\left[\frac{dY}{Y}\right]$, can be written as a summation of the effect of a change in the own profit share on own private excess demand in each country, the effect of a change in the profit share of the trade partners on net exports of each country, the national multiplier effects of a change in own private excess demand on C, I, and M, and the effect of changes in the income of the trade partners on income of each country via the effects on exports:

[22] The elasticity of C with respect to Y, e_{CY}, is calculated as $e_{CR}\pi + e_{CW}(1-\pi)$, where e_{CR} and e_{CW} are the elasticity of C with respect to profit and wage income respectively. Thus e_{CY} is a weighted average of the elasticities of C with respect to R and W, where weights are the shares of R and W in Y (at sample mean). The state sector has been excluded from the analysis in this paper; clearly with automatic stabilizers like direct taxes and transfers, the multiplier values will be smaller.

[23] We examine the euro area as a single economic unit, and therefore do not include Germany, France, and Italy separately at the national level in the calculation of the global interactions. The thirteen large economies constitute more than 80% of the global GDP. Since we have not estimated the effects of income distribution on export prices and private excess demand for the other countries in the world, which constitute the remaining 20% of the global GDP, it is not straightforward to integrate the effects of changes in income distribution in these countries. Therefore, we assume that income distribution in the other countries (other than the thirteen large economies in our sample) is not changing. Obviously, if these were also changing the cumulative effects will be even higher. In the following, when we refer to a world-wide increase in the profit share, we are referring to an increase in only the thirteen large economies with other things being held constant in the rest of the world.

$$\left[\frac{dY}{Y}\right]_{nx1} = \begin{bmatrix} \frac{dY_1}{Y_1} \\ \vdots \\ \frac{dY_n}{Y_n} \end{bmatrix} = E_{nxn} \begin{bmatrix} \delta\pi_1 \\ \vdots \\ \delta\pi_n \end{bmatrix} + P_{nxn} \begin{bmatrix} \delta\pi_1 \\ \vdots \\ \delta\pi_n \end{bmatrix} + H_{nxn} \begin{bmatrix} \frac{\delta Y_1}{Y_1} \\ \vdots \\ \frac{\delta Y_n}{Y_n} \end{bmatrix} + (W_{nxn}) \begin{bmatrix} \frac{\delta Y_1}{Y_1} \\ \vdots \\ \frac{\delta Y_n}{Y_n} \end{bmatrix}$$

(15)

E is a diagonal *nxn* matrix, where the diagonal elements are the effect of a change in the profit share in country j on private excess demand (C+I+NX) as summarized in Table 11.

$$E_{nxn} = \begin{bmatrix} \frac{\frac{\delta C}{Y}_1 + \frac{\delta I}{Y_1} + \frac{\delta NX}{Y}_1}{\delta\pi_1} & 0 & \cdots & 0 \\ 0 & \ddots & \vdots & \vdots \\ \vdots & \cdots & \ddots & \vdots \\ 0 & \cdots & \cdots & \frac{\frac{\delta C}{Y}_n + \frac{\delta I}{Y_n} + \frac{\delta NX}{Y}_n}{\delta\pi_n} \end{bmatrix}$$

(16)

P is an *nxn* matrix, which shows the effect of a change in a trade partner's profit share on the net exports in each country:

$$P_{nxn} = \begin{bmatrix} 0 & \frac{\frac{\delta NX}{Y}_1}{\Delta\pi_2}\frac{M_{21}}{M_1} & \cdots & \frac{\frac{\delta NX}{Y}_1}{\Delta\pi_n}\frac{M_{n1}}{M_1} \\ \frac{\frac{\delta NX}{Y}_2}{\delta\pi_1}\frac{M_{12}}{M_2} & 0 & \vdots & \frac{\frac{\delta NX}{Y}_2}{\delta\pi_n}\frac{M_{n2}}{M_2} \\ \vdots & \cdots & \ddots & \vdots \\ \frac{\frac{\delta NX}{Y}_n}{\delta\pi_1}\frac{M_{1n}}{M_n} & \frac{\frac{\delta NX}{Y}_n}{\delta\pi_2}\frac{M_{2n}}{M_n} & \cdots & 0 \end{bmatrix}$$

(17)

The diagonal elements of P are zero; the off-diagonal elements are calculated as:

$$P_{ij} = \frac{\frac{\delta NX}{Y}_i}{\delta \pi_j} \frac{M_{ji}}{M_i} = (e_{P_x ULC_j} \frac{1}{1 - e_{P\ ULCj}} \frac{Yf_j}{Y_j} \frac{1}{rulc_j}) \frac{M_{ji}}{M_i} (e_{XP_{xi}} \quad \frac{\mathrm{X_i}}{\mathrm{Y_i}} - e_{MPi} \quad \frac{\mathrm{M_i}}{\mathrm{Y_i}})$$

(18)

The term in the first parentheses shows the effect of a change in the profit share of country j on its export prices (elasticities as discussed above in Equation (11) in section 4.3). This change is weighted by the share of imports from country j to country i in country i's total imports to reflect the effect on country i's import prices. The last term calculates the effect of this change in import prices on country i's exports-imports, each weighted by the share of exports and imports in GDP.

H is an *nxn* diagonal matrix, which shows the effect of an autonomous change in aggregate demand on C, I, and NX in each country and reflects the national multiplier effects as discussed in Equation (14):

$$H_{nxn} = \begin{bmatrix} \frac{\delta C_1}{\delta Y_1} + \frac{\delta I_1}{\delta Y_1} - \frac{\delta M_1}{\delta Y_1} & 0 & \cdots & 0 \\ 0 & \ddots & \vdots & \vdots \\ \vdots & \cdots & \ddots & \vdots \\ 0 & \cdots & \cdots & \frac{\delta C_n}{\delta Y_n} + \frac{\delta I_n}{\delta Y_n} - \frac{\delta M_n}{\delta Y_n} \end{bmatrix}$$

(19)

where $H_{ii} = \frac{\partial C_i}{\partial Y_i} + \frac{\partial I_i}{\partial Y_i} - \frac{\partial M_i}{\partial Y_i} = e_{CYi} \frac{C_i}{Y_i} + e_{YIi} \frac{I_i}{Y_i} - e_{MYi} \frac{M_i}{Y_i}$. (20)

W is an *nxn* matrix, which shows the effects of a change in a trade partner's GDP on the exports of each country:

$$W_{nxn} = \begin{bmatrix} 0 & e_{XY_{rw}1}\frac{X_1}{Y_1}\frac{Y_2}{Y_w} & \cdots & e_{XY_{rw}1}\frac{X_1}{Y_1}\frac{Y_n}{Y_w} \\ e_{XY_{rw}2}\frac{X_2}{Y_2}\frac{Y_1}{Y_w} & 0 & \vdots & e_{XY_{rw}2}\frac{X_2}{Y_2}\frac{Y_n}{Y_w} \\ \vdots & \cdots & \ddots & \vdots \\ e_{XY_{rw}n}\frac{X_n}{Y_n}\frac{Y_1}{Y_w} & e_{XY_{rw}n}\frac{X_n}{Y_n}\frac{Y_2}{Y_w} & \cdots & 0 \end{bmatrix} \quad (21)$$

The diagonal elements of this matrix are zero, and the off-diagonal element W_{ij} is the effect of a change in county j's income on country i's exports (as a ratio to GDP), and is calculated as the elasticity of exports of country i with respect to the GDP of the rest of the world multiplied by the share of exports in GDP in country i and weighted by the share of country j in world GDP.

Solving Equation (15) for $\left[\frac{dY}{Y}\right]$, we get the equivalent of a global multiplier effect:

$$\begin{bmatrix} \frac{dY_1}{Y_1} \\ \vdots \\ \frac{dY_n}{Y_n} \end{bmatrix} = (I_{nxn} - H_{nxn} - W_{nxn})^{-1}(E_{nxn} + P_{nxn}) \begin{bmatrix} \delta\pi_1 \\ \vdots \\ \delta\pi_n \end{bmatrix} \quad (22)$$

For the case when all economies increase their profit share by 1%-point simultaneously, the immediate effects that incorporate the effects on C, I, and NX due to changes in own profit share as well as trade partners' profit share, thus $(E + P)\begin{bmatrix} 1 \\ \vdots \\ 1 \end{bmatrix}$ are shown in the third column of Table 13. For comparison, columns one and two show the change in private excess demand and the total change in aggregate demand as a result of the national multiplier mechanism in response to a nationally isolated 1%-point increase in the profit share.

[Table 13]

Most interestingly, the strongly profit-led economy of Canada and the moderately profit-led India both start contracting after incorporating only the effects of decreasing import prices on net exports when major trade partners also decrease their wage share. In these two countries, the expansionary effects of an increase in the profit share are reversed when relative competitiveness effects are reduced as all countries are implementing a similar wage competition strategy. Comparing columns one and three, the contraction in private excess demand in the originally wage-led countries (euro zone, UK, US, Japan, Turkey, and Korea) is now much deeper, and in the remaining profit-led countries (Australia, Mexico, Argentina, China, and South Africa) the expansion is weaker than what would have been in the case of a nationally isolated increase in the profit share.

Finally, the total effects of the global multiplier process incorporating both national and international multiplier effects can be seen in column four of Table 13. The most interesting result here is that the originally profit-led Mexico and Argentina also contract by 0.1% now that the effects of a contraction in the GDP of the rest of the world are incorporated. Canada and India contract further, although the overall effect of distribution in India is still very modest (a contraction of 0.03%). The global effect in India is only related to the changes in the import prices of trade partners because the elasticity of exports with respect to the income of trade partners is statistically zero. Comparing columns two and four, both of which include the multiplier mechanism, the wage-led economies contract more strongly now. The euro area, the UK, and Japan contract by 0.18-0.25% and the US contracts by 0.92% as a result of a simultaneous decline in the wage share. In the developing world, the two wage-led economies of Turkey and Korea contract at very high rates by 0.72% and 0.86% respectively. Australia, South Africa, and China are the only three countries that can continue to grow out of a simultaneous world decline in the wage share. However, the growth rates in these countries are

also reduced in comparison, e.g. in China the growth rate decreases by 0.82%-point when all the thirteen economies decrease their wage share; China now grows at a rate of 1.15% only.

Overall a 1%-point simultaneous decline in the wage share in these thirteen large economies of the world lead to a decline in the global GDP by 0.36%-points (the average of the growth rates in column 4 of Table 13 weighted by the share of each country in the world GDP). Thus the world economy in aggregate is wage-led; if there is a simultaneous decline in the wage share in all countries (or as in our case in the thirteen major economies of the world), aggregate demand in the world economy also decreases.

Finally, we simulate the effects of an alternative scenario of a simultaneous increase in the wage share in these thirteen large economies. Obviously if all the countries increase their wage share by 1%-point, global GDP would grow by 0.36%; however, the economies of China, South Africa, and Australia would contract. In an alternative scenario shown in Table 14, all countries can grow along with an increase in the wage share, if all wage-led countries return to their previous peak wage-share levels in the late 1970s or early 1980s. Moreover, if all profit-led countries increase their wage-share by 1-3%-points, all countries could grow, and the global GDP would increase by 3.05%.

[Table 14]

7. Conclusions

The dramatic decline in the wage share in both the developed and developing world during the neoliberal era of the post-1980s has accompanied lower growth rates at the global level. Our empirical estimations of the post-Keynesian/post-Kaleckian model examining the effect of income distribution on growth in sixteen large developed and developing countries offer three important findings to understand this adverse development. First, domestic private demand (i.e.

the sum of consumption and investment) is wage-led in all countries, because consumption is much more sensitive to an increase in the profit share than is investment; thus an economy is profit-led only when the effect of distribution on net exports is high enough to offset the effects on domestic demand. Second, foreign trade form only a small part of aggregate demand in large countries, and therefore the positive effects of a decline in the wage share on net exports do not suffice to offset the negative effects on domestic demand. Similarly, if countries, which have strong trade relations with each other (like the Euro area with a low trade volume with countries outside Europe), are considered as an aggregate economic area, the private demand regime is wage-led. Finally, the most novel finding of this paper is that even if there are some countries, which are profit-led, the global economy is wage led. Thus, a simultaneous wage cut in a highly integrated global economy leaves most countries with only the negative domestic demand effects, and the global economy contracts. Furthermore some profit-led countries contract when they decrease their wage-share, if a similar strategy is implemented by their trading partners. Thus beggar the neighbor policies cancel out the competitiveness advantages in each country and are counter-productive.

Among the developed countries, the US, Japan, the UK, the Euro area as well as Germany, France, and Italy are wage-led. Canada and Australia are the only developed countries that are profit-led; in these small open economies, distribution has a large effect on net exports. Among the developing countries, only Turkey and Korea are wage-led. China is very strongly profit-led due to strong effects on exports and imports. South Africa is also profit-led with a relatively high impact of distribution, which is partly related to a very low difference in the marginal propensity to consume out of profits and wages. Mexico and Argentina have a profit-led private demand regime due to strong effect of profits on both investment and net exports in Mexico, and a very weak effect on consumption in Argentina. India is profit-led, but the effect of distribution is rather low.

When we go beyond the nation state, interesting shifts in the demand regimes occur. A world-wide race to the bottom in the wage share, to be precise a simultaneous increase in the profit share by 1 per cent -point in thirteen developed and developing countries, leads to a 0.36 per cent decline in global GDP. Most interestingly, some profit-led countries, specifically Canada, India, Argentina, and Mexico also contract as an outcome of this race to the bottom. However, the expansionary effects of a pro-capital redistribution of income in these countries are reversed when relative competitiveness effects are reduced as all countries implement a similar low wage competition strategy; this consequently leads to a fall in the GDP of the rest of the world as well as import prices. A lower wage share leads to lower growth in even the majority of the profit-led countries. The wage-led economies contract more strongly in the case of a simultaneous decrease in the wage share. Australia, South Africa, and China are the only three countries that can continue to grow despite a simultaneous decline in the wage share; however the growth rates in these countries are also reduced in this case.

These results have important policy conclusions. First, at the national level, if a country is wage-led, policies that lead to a pro-capital redistribution of income are detrimental to growth. Even in some wage-led cases, where the effect of distribution on growth is not very large, the results point at the presence of room for policies to decrease income inequality without hurting the growth potential of the economies.

Second, for the large economic areas with a high intra-regional trade and low extra-regional trade, like the Euro area, which tend to be wage-led, macroeconomic policy coordination, in particular with regards to wage policy, can improve growth and employment. Thus the wage moderation policy of the Euro area is not conducive to growth.

Third, a global wage-led recovery as a way out of the global recession, that is, a significant increase in the wage share leading to an increase in the global rate of growth, is economically feasible, and growth and an improvement in equality are consistent. This is true not only for

the wage-led countries but also for those that are profit-led, although in the latter the room for improving the wage share is more limited unless the structural parameters of the countries change. Thus even the profit-led countries can grow if there is a simultaneous increase in the wage share. Indeed in the majority of the profit-led countries, it is not at all possible to grow out of a pro-capital redistribution of income, when this strategy is implemented in many other large economies at the same time.

Addressing the problem of income inequality is even more important today with the background of the crisis. A recovery led by domestic demand and increase in the wage share in the global economy would help to reverse a major factor behind the global crisis, i.e. increasing inequality. Falling labor's share in the post-1980s has meant a decline in workers' purchasing power, which has limited their potential to consume. Demand deficiency reduced investments despite increasing profitability in most cases. Debt-led consumption, enabled by financial deregulation and housing bubbles seemed to offer a short-term solution in the US, UK, or the periphery of Europe. The current account deficits in these countries were matched by an export-led model and significant current account surpluses in countries like Germany in the core, or China in the periphery, where exports had to compensate for the insufficient domestic demand due to a falling or low labor's share. Capital outflows from these countries enabled the credit expansion in the countries driven by debt-led growth. In that respect, inequality in income distribution is one the major causes of the crisis along with financial deregulation at a national and international scale. In the face of falling wage share across the world, a global stagnation was avoided thanks to an increase in debt, mostly private, and global imbalances. After the collapse of the debt-led model with the global recession, the wage moderation policies of the last three decades proved to be unsustainable. Reversing inequality would bring us a step closer to eliminating a major cause of the crisis; it would also be a way of making the responsible pay for the crisis.

The findings are also important to show the danger of the austerity policies, which are pushed by governments across the developed world as a solution to the sovereign debt problem. Austerity policies with further detrimental effects on the wage share, which has started decreasing again from 2010 onwards, will only bring further stagnation. Our results also show that growth in China and a few developing countries alone cannot be the locomotive of global growth.

The results also point at two important policy conclusions for an alternative development paradigm: First, a global wage-led recovery can create space for domestic demand-led and more egalitarian growth strategies rather than export orientation based on low wages in the developing countries. A world-wide decrease in the wage share is leading to contractionary effects in most of the large developing countries. This is true not just for Turkey and Korea, which have wage-led regimes, but also for India, Mexico, and Argentina, which are profit-led in isolation, but contract when all their major trade partners implement similar wage competition policies. If the developed countries could avoid beggar thy neighbor policies, this would also create policy space for developing countries in a stable international economic environment. If the international environment is conducive, development and equality may be positively correlated. The working people in the developed countries have also stakes in such an international environment if they want to improve labor standards in the developing world to level the play field.

Second, even if some important developing countries are profit-led, like China and South Africa, south-south cooperation in the developing world can create a large economic area with complementary trade relations, where destructive wage competition policies are avoided via wage coordination. It is in place here to remember the lessons of the results for the Euro area: although some small open economies in the Euro area like Austria can be profit-led,

the Euro area in aggregate is wage-led; then the issue is one of economic policy coordination rather than unavoidable rules of economics.

Obviously, increasing the wage share and equality and stimulating demand cannot alone solve the problems for economic development. However, over the long run many of the supply constraints can be relaxed through expansionary demand policies, and the lack of effective demand can make the developing economies more susceptible to supply constraints (Dutt, 2010). Policies targeting a wage-led demand stimulus should be accompanied by policies to deal with industrial efficiency, technological change, and sustainable growth. A key to combine increasing equality with development is to rely more on domestic demand; this can be achieved partially by creating a domestic market via higher wages. The negative effects of a rising wage share on investment could partially be offset through an increase in domestic demand. Moreover as Storm and Naastepad (2011) demonstrate wage increases also stimulate productivity increases; but investment should also be stimulated through government policies via public investments, research and development and technology transfer as well as other means of industrial policy. However, as long as exports and imports remain so sensitive to labor costs as they are in the case of China, the regime could still remain to be profit-led. Thus policies should also target to change the composition of exports via a shift towards products with a lower price elasticity of demand. This again requires policies to improve productivity via investments to climb up the industrial ladder. In Korea, diversification in the structure of the industry as well as exports was initiated by the state via industrial policy; and China is now following this model (Amsden, 1989; Nolan, 1996).

Rebalancing growth via increasing domestic demand in the major developing countries, in particular China would also be helpful in addressing global imbalances. Our results show that redistribution of income in favor of labor increases consumption. However, this rebalancing can only take place in an international environment where the developed countries

not only leave space for developmentalist trade policies, and support technology transfer, but also create and expansionary global environment by avoiding a race to the bottom in wages.

There is a material basis for a global wage-led recovery, if the coordination problem among the countries can be overcome. However the coordination problem is a political economy issue related to both international relations and power relations between labor and capital within each country. Given the profit-led structures in some developing countries as well as small open economies in the developed world, the solution to the coordination problem requires a step forward by some large developed economies in terms of radically reversing the pro-capital distribution policies and taking an initiative towards wage and macroeconomic policy coordination. Given that wage competition has been the major policy stance for three decades by now, the credibility of a wage-led recovery scenario will require a stable commitment to the policy by some major countries; only then the incentives to resort to wage competition in small open economies, in particular in the developing world, can be avoided. Last but not least, the push for wage-led recovery can only come through a strengthening of the bargaining power of labor. Strengthening the power of the labor unions via an improvement in union legislation, increasing the coverage of collective bargaining, increasing the social wage via public goods and social security, establishing sufficiently high minimum wages, and levelling the global play-ground through international labor standards are the key elements in creating the balance of power relations in favor of a wage-led global recovery.

Furtnermore, the shift to a wage-led growth strategy can only happen as part of a fundamental shift in the priorities of macroeconomic policy towards full employment targeting policies. This will also require reintegrating the central banks's to the governments supporting these priorities, and limiting the power of finance. As Epstein (1992) shows, independent central banks and speculative financial structures have a negative effect on growth. Reversing the fall in the wage-share and implementing a wage-led growth strategy will have to include

measures to restrict financial speculation as well as bank bonuses, and establishing a non-profit oriented public financial sector.

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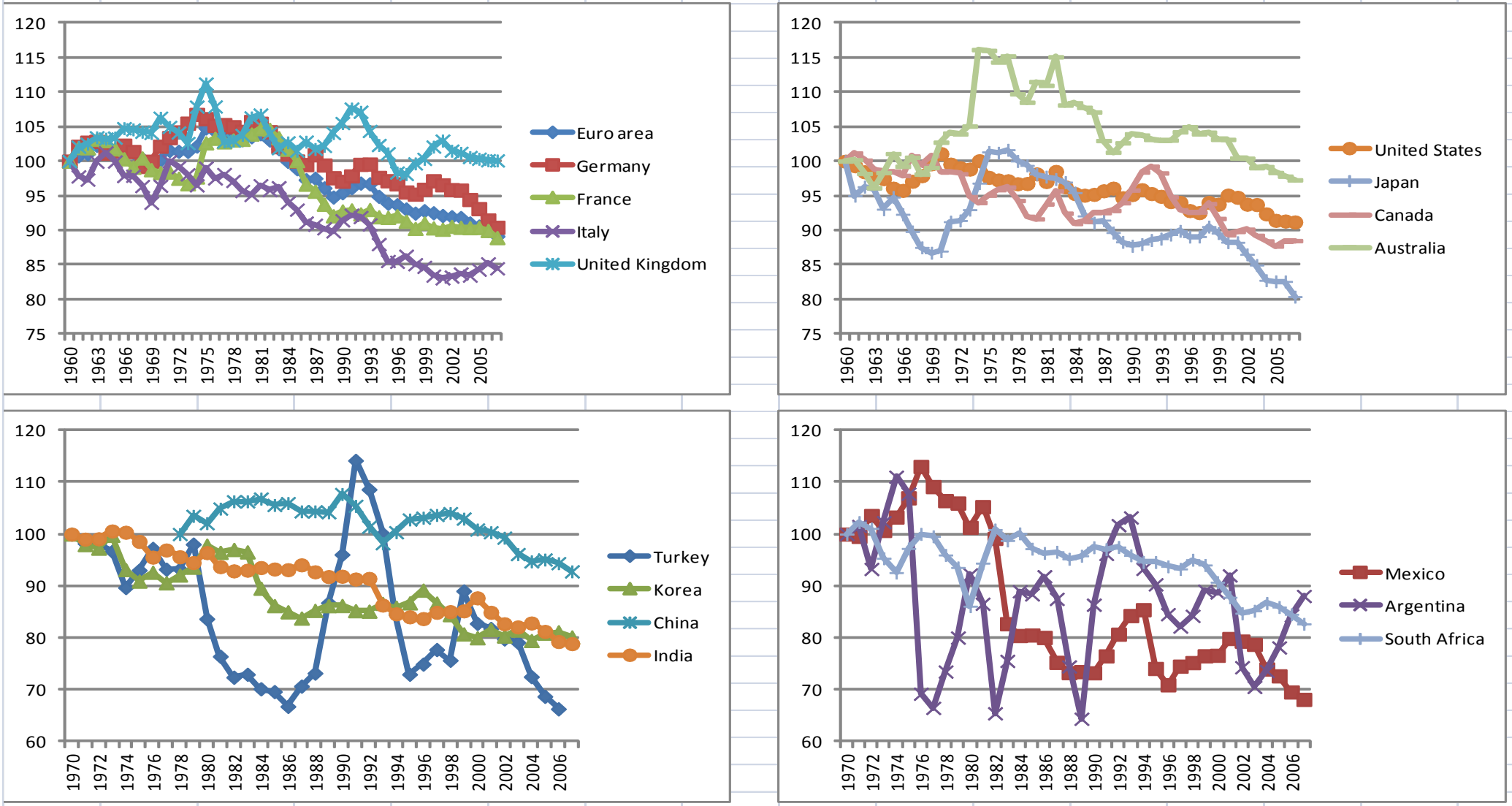
Figure 1 Wage share (adjusted, ratio to GDP at factor cost)



Source: See Appendix A for data sources.

Table 1a Average growth of GDP (%), developed countries

	Euro area-12	Germany	France	Italy	UK	US	Japan	Canada	Australia
1961-69	5.30	4.39	5.71	5.77	2.90	4.69	10.14	5.37	5.53
1970-79	3.78	3.27	4.15	4.02	2.42	3.32	5.21	4.11	3.07
1980-89	2.27	1.96	2.31	2.55	2.48	3.04	4.37	3.04	3.35
1990-99	2.15	2.32	1.86	1.43	2.24	3.21	1.46	2.44	3.32
2000-07	2.13	1.53	2.10	1.46	2.73	2.61	1.73	2.92	3.31

Table 1b Average growth of GDP, %, Developing Countries

	Turkey	Mexico	Korea	Argentina	China	India	South Africa
1970-79	4.86	6.41	10.27	2.92	6.11	2.68	3.03
1980-89	4.08	2.21	8.62	-0.73	9.75	5.69	2.24
1990-99	4.02	3.38	6.68	4.52	9.99	5.63	1.39
2000-07	5.23	3.06	5.20	3.51	10.51	7.26	4.30

Source: See Appendix A for data sources.

Table 2: Consumption: dependent variable dlog(C)

	c	*t-value*		dlog(Rt)	*t-value*		dlog(Wt)	*t-value*		DW	R2	Sample											
Euro area-12	0.006	*3.110*	***	0.127	*3.716*	***	0.739	*15.406*	***	1.871	0.873	1961 2007											
Germany	0.007	*2.439*	**	0.091	*1.576*		0.714	*10.162*	***	1.954	0.713	1961 2007											
France	0.007	*3.153*	***	0.137	*4.717*	***	0.640	*10.770*	***	2.120	0.771	1961 2007											
Italy	0.008	*2.474*	**	0.167	*4.101*	***	0.711	*8.621*	***	1.515	0.705	1961 2007											
Australia	0.017	*4.394*	***	0.098	*3.295*	***	0.440	*5.463*	***	1.831	0.411	1961 2007											
	c	*t-value*		dlog(Rt)	*t-value*		dlog(Wt)	*t-value*		ar(1)	*t-value*		DW	R2	Sample								
UK	0.006	*1.501*		0.162	*5.200*	***	0.735	*6.852*	***	0.331	*2.173*	**	1.838	0.683	1962 2007								
Canada	0.007	*1.911*	*	0.160	*6.268*	***	0.659	*6.852*	***	0.411	*2.904*	***	1.935	0.725	1962 2007								
	c	*t-value*		dlog(Rt)	*t-value*		dlog(Wt)	*t-value*		dlog(Rt-1)	*t-value*		dlog(Wt-1)	*t-value*		dlog(Ct-1)	*t-value*		DW	R2	Sample		
US	0.012	*4.048*	***	0.181	*4.968*	***	0.536	*6.509*	***	-0.114	*-2.523*	**	-0.140	*-1.389*		0.247	*1.517*		2.017	0.822	1962 2007		
	c	*t-value*		dlog(Rt-1)	*t-value*		dlog(Wt-1)	*t-value*		DW	R2	Sample											
Japan	0.011	*2.256*	**	0.083	*2.103*	**	0.611	*6.747*	***	2.300	0.599	1962 2007											
	c	*t-value*		dlog(Rt)	*t-value*		dlog(Wt)	*t-value*		dlog(Rt-1)	*t-value*		dlog(Wt-1)	*t-value*		dlog(Ct-1)	*t-value*	DW	R2	Sample			
Turkey	0.008	*0.506*		0.328	*2.840*	***	0.316	*2.432*	**	0.088	*0.688*		0.275	*1.824*	*	-0.151	*-0.873*	1.803	0.320	1972 2006			
	c	*t-value*		dlog(Rt)	*t-value*		dlog(Wt)	*t-value*		DW	R2	Sample											
Korea	-0.004	*-0.411*		0.072	*3.820*	***	0.845	*7.603*	***	2.073	0.641	1971 2007											
Argentina	0.003	*0.575*		0.430	*7.927*	***	0.579	*13.903*	***	1.944	0.855	1971 2007											
	c	*t-value*		dlog(Rt)	*t-value*		dlog(Wt)	*t-value*		AR(1)	*t-value*		DW	R2	Sample								
Mexico	0.006	*1.263*		0.376	*7.625*	***	0.566	*17.015*	***	0.477	*3.021*	***	1.878	0.905	1972 2007								
	c	*t-value*		dlog(Rt)	*t-value*		dlog(Wt)	*t-value*		dlog(Rt-1)	*t-value*		dlog(Wt-1)	*t-value*		DW	R2	Sample					
China	-0.011	*-0.583*		0.427	*3.731*	***	0.428	*1.923*	*	-0.186	*-1.571*		0.326	*1.643*	*	2.041	0.593	1980 2007					
	c	*t-value*		dlog(Rt)	*t-value*		dlog(Wt)	*t-value*		dlog(Rt-1)	*t-value*		dlog(Wt-1)	*t-value*		dlog(Yat)	*t-value*	dlog(Yat-	*t-value*		DW	R2	Sample
India	0.003	*0.530*		0.123	*3.270*	***	0.586	*4.317*	***	0.028	*0.903*		0.158	*1.319*		-0.009	*-0.100*	-0.168	*-2.324*	**	1.894	0.809	1972 2007
	c	*t-value*		dlog(Rt)	*t-value*		dlog(Wt)	*t-value*		dlog(Yat)	*t-value*		DW	R2	Sample								
South Africa	0.009	*2.939*	***	0.312	*9.030*	***	0.785	*10.101*	***	-0.061	*-3.400*	***	1.926	0.781	1971 2007								

Note: *, **, and *** stand for 10%, 5%, and 1% significance levels respectively

Table 3: The marginal effect of a 1%-point increase in the profit share on C/Y

Euro area-12	-0.439
Germany	-0.501
France	-0.305
Italy	-0.356
United Kingdom	-0.303
United States	-0.426
Japan	-0.353
Canada	-0.326
Australia	-0.256
Turkey	-0.491
Mexico	-0.438
Korea	-0.422
Argentina	-0.153
China	-0.412
India	-0.291
South Africa	-0.145

Table 4: Private Investment: dependent variable dlog(I)

	c	*t-value*		dlog(Yt)	*t-value*		dlog(πt)	*t-value*		dlog (It-1)	*t-value*		log (It-1)	*t-value*		log(Y_{t-1})	*t-value*		log(πt-1)	*t-value*		DW	R2	Sample
Euro area-12	-0.304	*-1.916*	*	2.238	*9.801*	**	-0.137	*-0.920*		0.088	*1.105*		-0.203	*-4.272*	**	0.207	*4.545*	**	0.093	*2.356*	**	1.820	0.865	1962 2007
Germany	-0.136	*-0.628*		1.805	*6.398*	**	0.058	*0.284*		0.183	*1.683*	*	-0.292	*-3.756*	**	0.266	*4.283*	**	0.172	*2.050*	**	1.829	0.748	1962 2007
	c	*t-value*		dlog(πt-1)	*t-value*		dlog(Yt)	*t-value*		ar(1)	*t-value*		DW	*R2*		Sample								
France	-0.027	*-2.654*	**	0.139	*1.657*	*	2.050	*10.505*	***	0.670	*5.569*	***	1.832	*0.822*		1963 2007								
	c	*t-value*		log(πt-1)	*t-value*		dlog(Yt)	*t-value*		dlog(Yt-1)	*t-value*		DW	*R2*		Sample								
Italy	0.229	*5.449*	***	0.241	*6.084*	***	2.094	*8.819*	***	0.516	*2.421*	**	2.524	*0.622*		1962 2007								
	c	*t-value*		log(πt-1)	*t-value*		dlog(Yt)	*t-value*		log (It-1)	*t-value*		log(Y_{t-1})	*t-value*		DW	*R2*		Sample					
UK	-1.143	*-2.500*	**	0.212	*2.513*	**	1.660	*5.429*	***	-0.350	*-3.392*	***	0.458	*3.278*	***	1.870	*0.593*		1961 2007					
	c	*t-value*		dlog(πt-1)	*t-value*		dlog(Yt)	*t-value*		dlog(Yt-1)	*t-value*		ar(1)	*t-value*		DW	*R2*		Sample					
US	-0.061	*-4.519*	***	0.077	*0.510*		2.738	*14.501*	***	0.367	*1.824*	*	0.612	*4.817*	***	1.697	*0.858*		1963 2007					
	c	*t-value*		dlog(πt)	*t-value*		dlog (It-1)	*t-value*		dlog(Yt)	*t-value*		dlog(Yt-1)	*t-value*		DW	*R2*		Sample					
Japan	-0.019	*-2.845*	***	0.185	*2.615*	**	0.485	*3.806*	***	1.982	*12.339*	***	-1.034	*-3.221*	***	2.126	*0.924*		1962 2007					
	c	*t-value*		dlog(πt-1)	*t-value*		dlog(Yt)	*t-value*		DW	*R2*		Sample											
Canada	-0.020	*-1.711*	*	0.318	*1.874*	*	1.780	*6.018*	***	1.593	*0.530*		1962 2007											
	c	*t-value*		dlog(πt)	*t-value*		dlog(Yt)	*t-value*		DW	*R2*		Sample											
Australia	-0.025	*-1.550*		0.256	*1.857*	*	2.021	*5.031*	***	1.821	*0.494*		1961 2007											
	c	*t-value*		log(πt)	*t-value*		dlog(Yt)	*t-value*		DW	*R2*		Sample											
Turkey	-0.056	*-0.547*		0.041	*0.294*		3.343	*6.456*	***	1.743	0.567		1971 2006											
	c	*t-value*		log(πt)	*t-value*		log(πt-1)	*t-value*		dlog(Yt)	*t-value*		dlog(Yt-1)	*t-value*		log (It-1)	*t-value*		log(Y_{t-1})	*t-value*		DW	R2	Sample
Argentina	0.135	*0.111*		0.190	*2.596*	**	-0.147	*-2.165*	**	2.808	*19.169*		0.325	*2.001*	**	-0.164	*-3.138*	***	0.147	*1.895*	*	1.982	0.943	1972 2007
	c	*t-value*		dlog(Yt)	*t-value*		dlog(πt)	*t-value*		dlog(πt-1)	*t-value*		dlog (It-1)	*t-value*		log (It-1)	*t-value*		log(Yt-1)	*t-value*		log(πt-1)	*t-value*	
Mexico	-1.778	*-2.722*	**	3.336	*13.407*	***	-0.349	*-2.044*	**	-0.259	*-1.511*		-0.040	*-0.616*		-0.343	*-4.383*	***	0.482	*3.765*	***	0.170	1.973	*
	c	*t-value*		dlog(πt-1)	*t-value*		dlog(Yt)	*t-value*		dlog (Igt)	*t-value*	DW	*R2*	Sample										
Korea	-0.110	*-5.834*	***	-0.011	*-0.311*		2.509	*10.320*	***	0.186	*1.960*	1.589	0.816	1972 2007										
	c	*t-value*		dlog(πt)	*t-value*		dlog (It-1)	*t-value*		dlog(Y)	*t-value*		dlog (Igt-1)	*t-value*		DW	*R2*		Sample					
China	-0.061	*-0.549*		-1.642	*-1.153*		-0.184	*-0.786*		2.405	*1.741*		0.492	*1.726*	*	1.805	0.259		1980 2007					
	c	*t-value*		dlog(πt)	*t-value*		dlog(Yt)	*t-value*		dlog (Igt-1)	*t-value*	DW	*R2*	Sample										
India	-0.018	*-0.682*		-0.164	*-1.190*		1.561	*3.856*	***	0.402	*2.868*	2.369	0.421	1972 2007										
	c	*t-value*		dlog(πt-1)	*t-value*		dlog(Yt-1)	*t-value*		dlog (Yat-1)	*t-value*	DW	*R2*	Sample										
South Africa	-0.010	-0.573		0.326	1.833	*	1.912	3.408	***	-0.179	-1.782	1.696	0.351	1972 2007										

Note: *, **, and *** stand for 10%, 5%, and 1% significance levels respectively

Table 5: The marginal effect of a 1%-point increase in the profit share on I/Y

Euro area-12	0.299
Germany	0.376
France	0.088
Italy	0.130
United Kingdom	0.120
United States	0.000
Japan	0.284
Canada	0.182
Australia	0.174
Turkey	0.000
Mexico	0.153
Korea	0.000
Argentina	0.015
China	0.000
India	0.000
South Africa	0.129

Table 6: Price deflator: dependent variable dlog(P)

	c	*t-value*		dlog(ULCt-1)	*t-value*		dlog(Pmt)	*t-value*		DW	R2	Sample					
Euro area-12	0.014	*3.518*	***	0.624	*7.846*	***	0.123	*2.915*	***	1.515	0.747	1962 2007					
Italy	0.018	*3.525*	***	0.604	*9.320*	***	0.202	*4.988*	***	1.731	0.827	1962 2007					
UK	0.018	*3.018*	***	0.568	*6.713*	***	0.190	*2.993*	***	2.039	0.691	1962 2007					
Japan	0.013	*3.227*	***	0.516	*6.833*	***	0.095	*3.100*	***	1.666	0.630	1962 2007					
Canada	0.016	*3.983*	***	0.459	*5.335*	***	0.257	*4.481*	***	1.447	0.678	1962 2007					
	c	*t-value*		dlog(ULCt)	*t-value*		dlog(Pmt)	*t-value*		DW	R2	Sample					
Germany	0.012	*8.103*	***	0.618	*16.023*	***	0.031	*1.428*		1.491	0.864	1961 2007					
	c	*t-value*		dlog(ULCt-1)	*t-value*		dlog(Pt-1)	*t-value*		dlog(Pmt)	*t-value*		DW	R2	Sample		
France	0.007	*2.360*	**	0.275	*2.141*	**	0.522	*3.394*	***	0.086	*3.281*	***	1.809	0.907	1962 2007		
	c	*t-value*		dlog(ULCt-1)	*t-value*		dlog(Pt-1)	*t-value*		dlog(Pmt)	*t-value*		dlog(Pmt-1)	*t-value*		DW	R2	Sample
US	0.009	*5.219*	***	0.211	*2.710*	**	0.429	*4.836*	***	0.109	*8.403*	***	0.044	*2.590*	**	1.745	0.951	1962 2007
	c	*t-value*		dlog(ULCt)	*t-value*		dlog(Pmt)	*t-value*		dlog(Pmt-1)	*t-value*		DW	R2	Sample			
Australia	0.016	*4.324*	***	0.624	*8.856*	***	-0.031	*-0.579*		0.150	*3.429*	***	1.976	0.814	1962 2007			
	c	*t-value*		dlog(ULCt)	*t-value*		dlog(Pt-1)	*t-value*		dlog(Pmt)	*t-value*		DW	R2	Sample			
Turkey	0.011	*0.643*		0.354	*5.402*	***	0.263	*4.280*	***	0.364	*7.124*	***	2.196	0.949	1972 2006			
	c	*t-value*		dlog(ULCt)	*t-value*		dlog(ULCt-1	*t-value*		dlog(Pt-1)	*t-value*		dlog(Pmt)	*t-value*		DW	R2	Sample
Mexico	0.008	*0.884*		0.700	*8.642*	***	-0.265	*-2.136*	**	0.309	*2.875*	***	0.261	7.178	***	2.387	0.979	1972 2007
	c	*t-value*		dlog(ULCt)			dlog(Pmt)	*t-value*		dlog(Pmt-1)	*t-value*		DW	R2	Sample			
Korea	0.016	*3.026*	***	0.735	*10.508*	***	0.073	*1.709*	*	0.095	*2.685*	**	1.887	0.912	1972 2007			
	c	*t-value*		dlog(ULCt)	*t-value*		dlog(Pmt)	*t-value*		DW	R2	Sample					
Argentina	0.002	*0.162*		0.640	*17.025*	***	0.359	*9.597*	***	1.828	0.994	1971 2007					
India	0.023	*5.114*	***	0.756	*12.205*	***	0.009	*0.401*		2.020	0.854	1971 2007					
South Africa	0.033	*2.611*	**	0.618	*5.634*	***	0.124	*1.946*	*	1.897	0.567	1971 2007					
	c	*t-value*		dlog(ULCt)	*t-value*		dlog(Pt-1)	*t-value*		dlog(Pmt)	*t-value*	DW	R2	Sample			
China	0.009	*1.643*	*	0.771	*7.480*	***	0.066	*0.602*		0.030	*0.831*	1.425	0.864	1979 2007			

Note: *, **, and *** stand for 10%, 5%, and 1% significance levels respectively

Table 7: Export price deflator: dependent variable dlog(Px)

	c	*t-value*		dlog(ULCt-1)	*t-value*		dlog(Pxt-1)	*t-value*		dlog(Pmt)	*t-value*		DW	R2	Sample								
Euro area-12	0.003	*1.670*	*	0.165	*3.141*	***	0.102	*2.504*	**	0.566	*27.168*	***	1.586	0.970	1962 2007								
Germany	0.004	*1.557*		0.216	*2.845*	***	0.214	*2.631*	**	0.355	*9.780*	***	1.719	0.813	1962 2007								
Italy	0.004	*0.960*		0.178	*2.616*	**	0.156	*2.695*	**	0.569	*19.040*	***	2.495	0.946	1962 2007								
	c	*t-value*		log(Pxt-1)	*t-value*		log(ULCt-1)	*t-value*		log(Pmt-1)	*t-value*		dlog(ULCt)	*t-value*		dlog(Pmt)	*t-value*		ar(1)	*t-value*		DW	R2	Sample
France	0.429	3.756	***	-0.663	-4.558	***	0.098	1.710	*	0.475	5.253	***	-0.117	-1.131		0.545	17.814	***	0.722	4.160	***	1.760	0.962	1962 2007
	c	*t-value*		log(Pxt-1)	*t-value*		log(ULCt-1)	*t-value*		log(Pmt-1)	*t-value*		dlog(ULCt)	*t-value*		dlog(Pmt)	*t-value*		DW	R2	Sample			
United Kingdom	0.043	1.592		-0.412	-3.895	***	0.061	2.120	**	0.342	*4.132*	***	0.179	*2.378*	**	0.575	*12.748*	***	1.600	0.924	1961 2007			
United States	0.374	3.479	***	-0.352	-3.238	***	0.049	1.973	*	0.223	*3.214*	***	0.397	*2.765*	***	0.489	*11.547*	***	1.929	0.913	1961 2007			
	c	*t-value*		dlog(ULCt)	*t-value*		dlog(Pmt)	*t-value*		DW	R2	Sample												
Japan	-0.012	*-4.226*	***	0.313	*5.610*	***	0.389	*16.889*	***	2.023	0.921	1961 2007												
Australia	0.014	*1.263*		0.374	*1.798*	*	0.316	*2.121*	**	1.625	0.352	1961 2007												
	c	*t-value*		dlog(ULCt)	*t-value*		dlog(ULCt-1)	*t-value*		dlog(Pmt)	*t-value*		DW	R2	Sample								
Canada	0.004	*0.632*		0.620	*3.209*	***	-0.472	*-2.712*	**	0.820	*8.822*	***	1.932	0.795	1962 2007								
	c	*t-value*		dlog(ULCt-1)	*t-value*		dlog(Pmt)	*t-value*		DW	R2	Sample												
Turkey	-0.013	*-0.395*		0.179	*1.827*	*	0.868	*9.972*	***	2.277	0.851	1972 2007												
	c	*t-value*		dlog(ULCt)	*t-value*		dlog(Pmt)	*t-value*		DW	R2	Sample												
Mexico	0.014	*0.830*		0.260	*2.514*	**	0.675	*9.619*	***	2.112	0.925	1971 2007												
Argentina	0.014	*0.913*		0.107	*2.858*	***	0.878	*23.456*	***	2.014	0.994	1971 2007												
China	-0.008	*-0.773*		0.322	2.234	**	1.035	*14.034*	***	1.772	0.905	1979 2007												
India	0.022	*1.259*		0.693	*2.879*	***	0.109	*1.322*		1.711	0.342	1971 2007												
	c	*t-value*		dlog(ULCt)	*t-value*		dlog(Pxt-1)	*t-value*		dlog(Pmt)	*t-value*		DW	R2	Sample								
Korea	-0.013	*-1.578*		0.336	*2.911*	***	0.009	*0.127*		0.614	*9.198*	***	1.703	0.886	1972 2007								
	c	*t-value*		dlog(ULCt)	*t-value*		dlog(Pmt)	*t-value*		ar(1)	*t-value*		DW	R2	Sample								
South Africa	0.068	*1.660*	*	-0.529	*-1.516*		0.957	*6.374*	***	0.357	*1.995*	*	1.699	0.616	1972 2007								

Note: *, **, and *** stand for 10%, 5%, and 1% significance levels respectively

Table 8: Exports: dependent variable dlog(X)

	c	*t-value*		dlog(Px/Pmt)	*t-value*		dlog(Xt-1)	*t-value*		dlog(Yrwt)	*t-value*		dlog(Et)	*t-value*		DW	R2	Sample					
Euro area-12	-0.021	*-1.042*		-1.304	*-4.813*	***	0.161	*1.460*		1.884	*3.821*	***	0.141	*1.916*	*	1.683	0.643	1971 2007					
France	-0.030	*-2.151*	**	-0.314	*-2.204*	**	0.265	*2.466*	**	2.065	*5.952*	***	0.172	*2.016*	**	1.765	0.601	1971 2007					
	c	*t-value*		dlog((Px/Pm)t-1)	*t-value*		dlog(Yrwt)	*t-value*		DW	R2	Sample											
Germany	0.000	*0.002*		-0.428	*-1.967*	*	1.779	*2.911*	***	2.121	0.207	1971 2007											
	c	*t-value*		dlog(Px/Pmt)	*t-value*		dlog(Yrwt)	*t-value*		DW	R2	Sample											
Italy	-0.005	*-0.266*		-0.273	*-1.760*	*	1.554	*3.028*	***	1.863	0.308	1971 2007											
UK	0.011	*0.821*		-0.519	*-3.771*	***	1.057	*2.885*	***	1.636	0.443	1971 2007											
Japan	0.014	*0.617*		-0.428	*-4.039*	***	1.293	*1.984*	*	2.169	0.355	1971 2007											
Australia	0.036	*1.782*	*	-0.235	*-1.891*	*	0.472	*0.779*		1.944	0.095	1971 2007											
	c	*t-value*		dlog(Px/Pmt)	*t-value*		dlog(Yrwt)	*t-value*		dlog(Et-1)	*t-value*		ar(1)	*t-value*		DW	R2	Sample					
US	-0.037	*-1.990*	*	-0.286	*-2.182*	**	2.935	*6.099*	***	0.113	*2.051*	**	0.517	*3.427*	***	2.315	0.727	1972 2007					
	c	*t-value*		dlog((Px/Pm)t-1)	*t-value*		dlog(Xt-1)	*t-value*		dlog(Yrwt)	*t-value*		DW	R2	Sample								
Canada	-0.026	*-1.498*		-0.558	*-2.774*	***	0.172	*1.371*		2.056	*4.163*	***	1.648	0.495	1971 2007								
	c	*t-value*		dlog(RULCt-1)	*t-value*		dlog(Yrwt)	*t-value*	DW	R2	Sample												
Turkey	0.051	*0.794*		-0.557	*-1.903*	*	0.899	*0.488*	2.454	0.100	1972 2007												
	c	*t-value*		dlog(RULCt)	*t-value*		dlog(Yrwt)	*t-value*		ar(1)	*t-value*		DW	R2	Sample								
Mexico	0.005	*0.160*		-0.436	*-2.095*	**	2.395	*3.067*	***	0.463	*2.713*	**	1.912	0.382	1972 2007								
	c	*t-value*		log(Xt-1)	*t-value*		log(Px/Pmt-1	*t-value*		log(Yrwt-1)	*t-value*		dlog(Px/Pm	*t-value*		dlog(Xt-	*-value*		dlog(Yrwt)	*t-value*		DW	R2	Sample
Korea	-42.041	*-3.741*	***	-0.396	*-4.009*	***	-0.198	*-1.713*	*	1.510	*3.769*	***	0.256	*0.964*		0.082	*0.592*		3.213	*3.262*	***	1.616	0.586	1972 2007
	c	*t-value*		dlog(Px/Pmt)	*t-value*		dlog(Xt-1)	*t-value*		dlog(Yrwt)	*t-value*		DW	R2	Sample								
Argentina	-0.053	*-1.397*		-0.318	*-1.712*	*	0.091	*0.611*		3.433	*3.148*	***	1.715	0.257	1972 2007								
China	0.010	*0.195*		-1.175	*-3.200*	***	0.396	*2.556*	**	2.584	*1.742*	*	1.900	0.457	1980 2007								
India	0.084	*2.371*	**	-0.253	*-2.364*	**	0.185	*1.165*		-0.220	*-0.229*		1.899	0.177	1972 2007								
	c	*t-value*		dlog(Px/Pmt)	*t-value*		dlog(Yrwt)	*t-value*		DW	R2	Sample											
South Africa	-0.007	*-0.373*		-0.126	*-1.036*		1.101	*1.876*	*	1.457	0.096	1971 2007											

Note: *, **, and *** stand for 10%, 5%, and 1% significance levels respectively

Table 9: Imports: dependent variable dlog(M)

	c	*t-value*		dlog((P/Pm)t-1)	*t-value*		dlog(Yt)	*t-value*		DW	R2	Sample											
Euro area-12	-0.008	*-0.433*		0.236	*1.182*		2.035	*3.450*	***	1.537	0.329	1962 2007											
Italy	-0.008	*-0.759*		0.233	*2.390*	**	2.136	*6.818*	***	2.219	0.607	1962 2007											
Japan	0.010	*0.740*		0.255	*3.299*	***	1.136	*4.576*	***	1.835	0.499	1962 2007											
	c	*t-value*		dlog((P/Pm)t-1)	*t-value*		dlog(Yt)	*t-value*		ar(1)	*t-value*		DW	R2	Sample								
Germany	0.009	0.990		0.005	0.046		1.911	*7.083*	***	0.283	*1.848*	*	1.903	0.618	1963 2007								
	c	*t-value*		log(Mt-1)	*t-value*		log((P/Pm)t-1)	*t-value*		log(Yt-1)	*t-value*		dlog((P/Pm)t)	*t-value*		dlog(Yt)	*t-value*		DW	R2	Sample		
France	-2.452	-4.565	***	-0.292	-3.932	***	0.140	*2.796*	***	0.573	*4.330*	***	0.069	*0.989*		2.923	*8.361*	***	2.166	0.782	1961 2007		
United Kingdom	-2.954	-4.748	***	-0.414	-4.773	***	0.130	*3.178*	***	0.769	*4.814*	***	-0.024	*-0.388*		1.698	*8.584*	***	2.142	0.739	1961 2007		
United States	-4.610	-4.639	***	-0.414	-4.422	***	0.177	*3.755*	***	0.826	*4.554*	***	0.132	*1.651*	*	2.341	*9.783*	***	1.905	0.787	1961 2007		
	c	*t-value*		dlog(P/Pmt)	*t-value*		dlog(Yt)	*t-value*		DW	R2	Sample											
Australia	-0.017	*-0.823*		0.558	*2.964*	***	1.886	*3.576*	***	2.081	0.374	1961 2007											
	c	*t-value*		dlog(P/Pmt)	*t-value*		dlog(Yt)	*t-value*		dlog(Yt-1)	*t-value*		dlog(Mt-1)	*t-value*		DW	R2	Sample					
Canada	0.000	-0.008		0.356	*2.570*	**	2.503	*8.780*	***	-1.636	*-4.164*	***	0.424	*3.369*	***	2.218	0.675	1962 2007					
	c	*t-value*		dlog(P/Pmt)	*t-value*		dlog(Yt)	*t-value*		DW	R2	Sample											
Turkey	0.019	*0.525*		0.546	*2.363*	**	1.684	*2.714*	**	1.809	0.390	1971 2007											
	c	*t-value*		dlog((P/Pm)t-1)	*t-value*		dlog(Yt)	*t-value*		dlog(Et)	*t-value*		dlog(Et-1)	*t-value*		DW	R2	Sample					
Mexico	-0.044	*-0.967*		0.472	*2.508*	**	2.591	*3.701*	***	-0.236	*-2.397*	**	0.368	*4.112*	***	1.506	0.691	1972 2007					
	C	*t-value*		dlog(P/Pmt)	*t-value*		dlog(Yt)	*t-value*		dlog(Mt-1)	*t-value*		AR(1)	*t-value*		DW	R2	Sample					
Korea	-0.040	*-1.322*		0.254	*1.703*	*	2.265	*8.287*	***	-0.177	*-1.420*		0.390	*2.003*	**	1.890	0.722	1973 2007					
	c	*t-value*		log(Mt-1)	*t-value*		log((P/Pm)t-1)	*t-value*		log(Yt-1)	*t-value*		dlog((P/Pm)t)	*t-value*		dlog(Mt-1	*t-value*		dlog(Yt)	*t-value*		DW	R2	Sample
Argentina	-27.542	*-3.653*	***	-0.536	*-4.214*	***	0.400	*4.148*	***	1.538	*3.845*	***	0.385	*4.594*	***	0.105	*1.807*	*	3.278	*11.568*	***	1.762	0.917	1972 2007
	c	*t-value*		log(Mt-1)	*t-value*		log((P/Pm)t-1)	*t-value*		log(Yt-1)	*t-value*		dlog((P/Pm)t-1	*t-value*		dlog(Mt-1	*t-value*		dlog(Yt)	*t-value*		DW	R2	Sample
China	-10.973	*-4.401*	***	-0.656	*-4.055*	***	0.521	*3.229*	***	0.984	*4.237*	***	-0.650	*-2.569*	**	0.333	*2.192*	**	2.690	*3.869*	***	2.167	0.669	1980 2007
	C	*t-value*		dlog((P/Pm)t)	*t-value*		dlog(Yt)	*t-value*		DLOG(M(t-1	*t-value*		DW	R2	Sample								
India	0.049	*1.871*	*	0.546	*4.984*	***	1.075	*2.493*	**	-0.079	*-0.628*		1.714	0.507	1972 2007								
	c	*t-value*		log(Mt-1)	*t-value*		log((P/Pm)t-1)	*t-value*		log(Yt-1)	*t-value*		dlog((P/Pm)t)	*t-value*		dlog(Yt)	*t-value*		DW	R2	Sample		
South Africa	-2.286	*-2.367*	**	-0.320	*-6.037*	***	0.320	*5.518*	***	0.383	*5.624*	***	0.311	*2.526*	**	4.065	*12.071*	***	2.179	0.864	1971 2007		

Note: *, **, and *** stand for 10%, 5%, and 1% significance levels respectively

Table 10: Calculation of the marginal effect of a 1%-point increase in the profit share on net exports

		Exports								Imports				Sum
									$\frac{\partial X/Y}{\partial \pi}$				$\frac{\partial M/Y}{\partial \pi}$	$\frac{\partial NX/Y}{\partial \pi}$
	eP.ULC	eULC.RULC	ePx.ULC	eX.Px	eX.RULC	RULC	Yf/Y	X/Y		eM.P	eM.RULC	M/Y		
	A	B	C	D	E (B*C*D)	F	G	H	I (-E*G*H/F)	J	K (A*B*J)	L	M (K*G*L/F)	I-M
Euro area	0.624	2.660	0.184	-1.304	-0.637	0.619	0.893	0.062	0.057	0.000	0.000	0.068	0.000	0.057
Germany	0.618	2.617	0.274	-0.428	-0.307	0.615	0.900	0.214	0.096	0.000	0.000	0.209	0.000	0.096
France	0.577	2.363	0.148	-0.428	-0.150	0.615	0.867	0.171	0.036	0.481	0.656	0.175	-0.162	0.198
Italy	0.604	2.527	0.211	-0.273	-0.146	0.623	0.909	0.174	0.037	0.233	0.356	0.172	-0.089	0.126
UK	0.568	2.316	0.148	-0.519	-0.178	0.643	0.885	0.195	0.048	0.313	0.412	0.195	-0.110	0.158
US	0.369	1.585	0.138	-0.286	-0.063	0.634	0.926	0.068	0.006	0.428	0.250	0.085	-0.031	0.037
Japan	0.516	2.066	0.313	-0.428	-0.276	0.673	0.933	0.074	0.028	0.255	0.271	0.070	-0.026	0.055
Canada	0.459	1.849	0.148	-0.558	-0.153	0.601	0.884	0.278	0.063	0.617	0.524	0.264	-0.203	0.266
Australia	0.624	2.661	0.374	-0.235	-0.234	0.597	0.904	0.140	0.049	0.558	0.926	0.159	-0.223	0.272
Turkey	0.481	1.927	0.179	-1.613	-0.557	0.459	0.937	0.123	0.140	0.546	0.506	0.139	-0.144	0.283
Mexico	0.629	2.695	0.260	-0.621	-0.436	0.466	0.928	0.148	0.128	0.472	0.800	0.159	-0.253	0.381
Korea	0.735	3.779	0.336	-0.500	-0.636	0.753	0.891	0.237	0.178	0.216	0.600	0.255	-0.181	0.359
Argentina	0.640	2.780	0.107	-0.318	-0.095	0.507	0.975	0.079	0.014	0.745	1.327	0.070	-0.178	0.192
China	0.771	4.376	0.322	-1.945	-2.741	0.504	0.867	0.232	1.095	0.795	2.683	0.193	-0.891	1.986
India	0.756	4.106	0.693	-0.253	-0.718	0.753	0.914	0.091	0.080	0.546	1.695	0.112	-0.230	0.310
South Afri	0.618	2.620	0.000	0.000	0.000	0.624	0.921	0.237	0.000	1.002	1.624	0.211	-0.506	0.506

Table 11. The summary of the effects of a 1%-point increase in the profit share

	C/Y	I/Y	NX/Y	Private excess demand/Y
	A	B	C	D (A+B+C)
Euro area-12	-0.439	0.299	0.057	-0.084
Germany	-0.501	0.376	0.096	-0.029
France	-0.305	0.088	0.198	-0.020
Italy	-0.356	0.130	0.126	-0.100
United Kingdom	-0.303	0.120	0.158	-0.025
United States	-0.426	0.000	0.037	-0.388
Japan	-0.353	0.284	0.055	-0.014
Canada	-0.326	0.182	0.266	0.122
Australia	-0.256	0.174	0.272	0.190
Turkey	-0.491	0.000	0.283	-0.208
Mexico	-0.438	0.153	0.381	0.096
Korea	-0.422	0.000	0.359	-0.063
Argentina	-0.153	0.015	0.192	0.054
China	-0.412	0.000	1.986	1.574
India	-0.291	0.000	0.310	0.018
South Africa	-0.145	0.129	0.506	0.490

Column A is based on Table 3, Column B is based on Table 5, Column C is based on Table 10.

Table 12 Elasticities of C, I, and M with respect to Y

	e_{CY}	e_{YI}	e_{MY}	h	Multiplier
Euro area-	0.551	1.020	2.035	0.371	1.590
Germany	0.516	0.913	1.911	0.071	1.076
France	0.494	2.050	1.963	0.280	1.388
Italy	0.539	2.610	2.136	0.422	1.730
United Kir	0.579	1.311	1.859	0.167	1.200
United Sta	0.387	3.105	1.996	0.519	2.080
Japan	0.464	1.840	1.136	0.584	2.407
Canada	0.499	1.780	1.505	0.176	1.214
Australia	0.324	2.021	1.886	0.291	1.410
Turkey	0.457	3.343	1.684	0.547	2.208
Mexico	0.471	1.406	2.591	0.097	1.108
Korea	0.725	2.509	2.265	0.452	1.824
Argentina	0.508	0.894	2.868	0.276	1.381
China	0.539	2.031	1.501	0.185	1.228
India	0.639	1.561	1.075	0.541	2.180
South Afri	0.632	1.912	1.199	0.327	1.487

Table 13: Summary of the multiplier effects at the national and global level

	The effect of a 1%-point increase in the profit share in only one country on private excess demand/Y	The effect of a 1%-point increase in the profit share in only one country on % change in aggregate demand (A*multiplier)	The effect of a simulataneous 1%-point increase on private excess demand/Y (includes effects of changes in Pm)	The effect of a simulataneous 1%-point increase on the % change in aggregate demand (C*multiplier (including effects of Yrw))
	A	B	C	D
Euro area-12	-0.084	-0.133	-0.119	-0.245
United Kingdom	-0.025	-0.030	-0.107	-0.214
United States	-0.388	-0.808	-0.426	-0.921
Japan	-0.014	-0.034	-0.043	-0.179
Canada	0.122	0.148	-0.020	-0.269
Australia	0.190	0.268	0.122	0.172
Turkey	-0.208	-0.459	-0.325	-0.717
Mexico	0.096	0.106	0.025	-0.111
Korea	-0.063	-0.115	-0.161	-0.864
Argentina	0.054	0.075	0.022	-0.103
China	1.574	1.932	1.289	1.115
India	0.018	0.040	-0.012	-0.027
South Africa	0.490	0.729	0.356	0.390

Column A is Column D in Table 11. The multiplier used in Column B is in Table 12.

Table 14. A scenario of global growth with a simultaneous decrease in the profit share

	Change in profit share	The % change in aggregate demand (includes national and global multiplier effects, i.e. changes in Pm and Yrw)
Euro area-12	-11.05	2.36
United Kingdom	-7.83	1.91
United States	-6.31	6.15
Japan	-16.71	1.49
Canada	-3.00	2.84
Australia	-3.00	0.03
Turkey	-18.41	10.81
Mexico	-3.00	1.45
Korea	-8.64	7.46
Argentina	-3.00	1.27
China	-1.00	5.56
India	-3.00	0.43
South Africa	-1.00	1.93

Appendix A: Data sources and definitions

ws: Adjusted wage share

EU12, Germany, France, Italy, UK, US, Japan, Canada, Australia: AMECO

Adjusted wage share = Compensation per employees * number of employed/ GDP at factor costs

Korea, Mexico, Turkey: OECD STAT online

Adjusted wage share=Compensation per employee*number of employed/value added at basic prices

Argentina:

1993-2005: Data supplied by Matthieu Charpe at the ILO/IILS in 2011;

Adjusted wage share=Compensation of employees /GDP at basic prices*1/ ratio of employees in total employment

1970-92 and 2006-07: data supplied by Lindenboim et al (2011);

Unadjusted wage share=Compensation of employees / gdp at basic prices

The adjusted and unadjusted wage share data are linked using %changes.

China:

Zhou et al (2010)'s adjusted wage share data calculated using the number of self-employed and national accounts data of China National Statistics Office, reported in Molero Simarro (2011), see footnote 7.

India:

Own calculations based on data supplied by the Ministry of Statistics and Program Implementation in the National Factor Income Summary Tables for 1970-74 and 1980-1999, and estimations supplied by Uma Rani Amara at the ILO/IILS for mixed income for 2000-2007 based on sectoral mixed income shares of 1999

Adjusted wage share methodology 1: labour compensation/(national income at factor cost-mixed revenues)

Adjusted wage share methodology 2: labour compensation+ Mixed revenues/ National Income at factor cost

Adjusted wage share average = average of adjusted wage share methodology 1 and 2

1975-1979: UN National Account data; unadjusted Wage share

The unadjusted wage share data for 1975-79 is linked with the adjusted wage share data based on %changes.

South Africa:

1989-2004: Data supplied by Matthieu Charpe at the ILO/IILS in 2011;

Adjusted wage Share = Compensation per employees * number of employed/ value added at basic prices

1970-88 and 2005-07: UN national accounts, unadjusted wage share

The two series are linked using %changes.

Other Data

For the following variables, data for the OECD countries are from the AMECO database, and data for the other countries are from the World Bank World Development Indicators (WDI), unless otherwise stated:

Y: GDP in market prices, real

Y_f: GDP at factor cost, real

C: Private consumption, real; for Argentina missing data in WDI is linked with the data supplied by Lindenboim et al (2011) for 1980-1992 based on % changes.

I: Private Investment, real; for Turkey AMECO data for 1998-2006 is linked with data in State Planning Organisation for 1970-1998; for Korea OECD STAT online; for Mexico Sistema de Cuantas Nacionales de Mexico, Estadisticas historicas de Mexico 2009; for India Central Statistical Organisation; for South Africa The South African Reserve Bank, for Argentina data supplied by Lindenboim et al (2011); for China private investment is calculated as total investment-investment by state owned and collective owned units based on the national accounts data of the National Bureau of Statistics

P: GDP deflator

P_M : Import price deflator

P_X : Export price deflator

X: Exports, real

M: Imports, real

M_{ji}: Imports from country j to country I, International Monetary Fund, Direction of Trade Statistics, 1980-2007 for all countries

E: Exchange rate; average of local currency per dollar, euro, and yen; WDI for all countries

Y_{rw}: GDP of the rest of world, real; calculated as World GDP (in constant 2000 US$)-Own GDP (in constant 2000 US$), source: World Bank World Development Indicators, 1970-2007 for all countries

W: Adjusted compensation of employees, real; calculated as $W=ws* Y_f$

π: Adjusted profit share; calculated as π=1-ws

R: Adjusted gross operating surplus, real; calculated as $R= \pi* Y_f$

rulc: Real unit labour costs; calculated as $rulc= ws* Y_f / Y$

ulc: Nominal unit labour costs; calculated as ulc=rulc* P

Appendix B

Theoretically total wage bill, W, consists of rural and urban wage bill W_a and W_u, and total operating surplus, R, consists of rural and urban operating surplus R_a and R_u (all adjusted for the self-employed). Then the consumption can be modeled as a function of wages and profits in the rural and urban areas:

$$C = c_o + c_{wa}W_a + c_{wu}W_u + c_{ra}R_a + c_{ru}R_u$$

Assuming that the wage per employee in the rural regions, w_a, is a fraction, c_1, of urban wage per employee, w_u, the wage bill in the rural regions, W_a, can be written as

$$W_a=c_1 w_u E_a$$

where E_a is the number of employees in the rural region. Total GDP, Y, consists of agricultural GDP, Y_a, and urban/non-agricultural GDP, Y_u. E_u is the number of employees in the urban regions. Assuming a constant relative labor productivity in the rural region compared to the urban region

$$Y_a/E_a \,/\, Y_u/E_u = c_2,$$

If $Y_a/Y = a$, then

$$E_a = c_2 E_u \, a/(1-a)$$

$$W_a=c_1 c_2 W_u a/(1-a)$$

To simplify, let us assume that $c_1 c_2=1$; then

$$W_u=(1-a)W$$

$$W_a=aW$$

The same applies to the operating surplus, a constant relative capital productivity in the rural region compared to the urban region:

$$R_u=(1-a)R$$

and

$$R_a=aR.$$

Then consumption is

$$C = co + c_{wa} aW + c_{wu}(1-a)W + c_{ra} aR + c_{ru}(1-a)R$$

$$C = c_o + (c_{wa} - c_{wu})aW + c_{wu} W + ((c_{ra} - c_{ru})aR + c_{ru} R$$

Assume the differences between marginal propensity to consume in the rural and urban regions are the same for both profit and wage income, thus

$$c_{ra} - c_{ru} = c_{wa} - c_{wu} = c_a - c_u$$

Then

$$C = c_o + (c_a - c_u)a(W+R) + c_{wu} W + c_{ru} R$$

$$= c_o + (c_a - c_u) Y_a + c_{wu} W + c_{ru} R$$

Thus, in the revised estimations, we need to augment Equation (1) with the agricultural GDP, Y_a. The elasticity of consumption with respect to R is $(c_{ru}+a(c_a- c_u))$ and elasticity with respect to W is $(c_{wu}+a(c_a- c_u))$. Thus the marginal effect of a change in the profit share on C is

$$\frac{\partial C/Y}{\partial R/Y} = (c_{ru}+a(c_a- c_u))C/R - (c_{wu}+a(c_a- c_u))C/W$$

$$= c_{ru}C/R - c_{wu}C/W + a(c_a- c_u)(C/R - C/W)$$