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Functional income distribution and growth in Thailand: A Post Keynesian econometric analysis

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Abstract: The aim of this article is to analyze the effect of the income distribution between labor and capital on the growth performance of Thailand from a Post Keynesian view. It rests on the theoretical model of Bhaduri and Marglin (1990) to see if an increase in the labor income share has a sufficient positive effect on consumption to offset a negative effect on investment and export demand. In order to investigate the question empirically we adopt and develop the approach of Stockhammer et al. (2009). Several measures of the labor income share are calculated to take into account the fact that wage labor represents only half of the total labor force and check the robustness of our results. We also introduce a new treatment of external trade to better integrate the price competitiveness of Thailand. The econometric investigation shows that the growth regime is profit-led over the period 1970-2011 which shows that rebalancing the Thai economy will be difficult and requires an overall change of strategy going beyond a simple pro-labor policy.

Key Words: *Thailand, functional distribution of income, Post Keynesian economics, growth, development*

Thailand is a small, open economy that enjoyed a high rate of growth of around 6% over the last five decades and became an upper-middle-income country in 2011 according to the World Bank's classification. A strong industrial push financed both by local and foreign investment prompted an intense structural change and set off a surge of industrial exports which became the primary engine of growth after Thailand had recovered from the Asian crisis of 1997-98. These facts are well-established and Thailand is typical of the second wave of export-led growth economies of Southeast Asia which followed Taiwan, South Korea, Hong Kong and Singapore.

The international crisis of 2008-09 and the uncertain recovery that followed show the limit of these export-led growth policies in particular now that the Chinese growth is decelerating. This raises the issue of rebalancing growth in favor of the domestic market not only for China but also for other Asian export-led growth countries like Thailand. A

stronger role for the domestic market implies that an increase of household consumption offsets at least in part a decline in net exports. This article explores this possibility by looking at the relation between the functional income distribution and demand. Rebalancing growth to lessen the dependence on exports will be much easier if an increase in the labor income share has a sufficient positive effect on consumption to offset a negative effect on investment and exports. If it is the case, the demand is wage-led; otherwise it is profit-led. We apply the Post Keynesian model developed by Stockhammer et al. (2009) which precisely addresses this question.

This is the first application of such a model on Thailand, most of previous publications being based on advanced economies or large Asian economies like China and India which have different structural features. Our second contribution is the use of an original approach to calculate the labor income share in the context of a developing country. The objective is to include non-wage labor income in the labor share so that the full impact of a change in income distribution on growth is taken into account. The third contribution is the deepening of Stockhammer et al. (2009) model with a new treatment of international trade, which employs export prices of competitor countries to explain exports and export prices of the country under investigation. This had not been done, in previous publications.

The article is organized as follows. Section 1 reviews the main characteristics of Thailand's macroeconomic performance. In Section 2 we compute various estimates of the Thai labor income share, which for the major part includes non-wage labor, to test the robustness of our overall results. In Section 3, we present the theoretical model and the changes we introduce in the analysis of the foreign trade. In section 4, we proceed to the

econometric investigation and present the results. We find that Thailand is a profit-led economy because an increase in the labor income share has a strong negative effect on net exports which is not offset by a positive effect of the domestic demand. An increase in the labor income share has either a positive but small effect on household's consumption or a perverse (negative) effect, while in all cases it has no significant effect on investment. Section 5 concludes and draws some policy implications. A redistribution of income in favor of labor would have short-term negative effect on demand. This does not mean that Thailand should not rebalance its growth but that a mere income policy is not the best suited one to achieve this goal.

Thailand's macroeconomic performance and structural change

Along with the founders of ASEAN (Association of South East Asian Nations), Thailand belongs to the second generation of the newly industrialized countries which emerged at the turn of the nineties. They follow the first generation of the four "dragons" (South Korea, Taiwan, Hong Kong and Singapore) which appeared at the turn of the eighties. Thailand was a poor country after the Second World War, but thanks to a 5.8% average growth rate over the period 1960-2013, it is now part of the upper middle-income group of countries according to the World Bank with a gross national income per capita of \$ 5,370 in 2013 below China (\$6,560) and above Indonesia \$3,580¹.

After an initial phase of import-substitution policy from 1950 to 1977, policy makers adopted a policy of export-promotion growth based on an active support of industry. This led to a high rate of growth achieved thanks to a strong industrial push during a boom phase (1987-1996) characterized by a strong domestic investment rate which at the time induced a trade deficit of 4.4% of the GDP. Despite a solid increase of

industrial exports, imports of intermediate and capital products were still higher. After the Asian crisis of 1997-98, which deeply affected Thailand with a 3.2% recession of GDP in real terms, the recovery was prompted by a strong export growth. The trade balance became this time positive amounting to 5.3% of GDP over the period 2000-2007. After the international crisis of 2008-09, the trade surplus still accounted for 3.4% over the period 2010-2014 while investment never recovered its pre-Asian crisis level². For this reason, Thailand has been characterized as an export-led economy since the Asian crisis (Tharnpanich and McCombie, 2013, p 572; Jetin, 2012, p 15, Felipe and Lim, 2005, p 22).

Thailand has recently become a very open economy with its sum of exports and imports amounting to around 80% of GDP. Industry in the broad sense (ISIC C-E) now makes up 36% of GDP to be compared with a world average of 22%, which places Thailand as an industrialized country³. This fast industrialization was based on rapid capital accumulation initialized and managed by the State which later on triggered a cumulative growth cycle whereby demand growth promotes productivity gains via the Kaldor-Verdoon relation, and labor productivity gains in turn leads to an increase in demand (Naastepad and Storm, 2005). However, except for limited periods of time, Thai workers have never fully benefited from this growth cycle because their real income has lagged behind productivity gains contributing toward achieving a high profit rate in the Thai economy as a whole and in particular in manufacturing (Jetin, 2012).

Nonetheless, the industrialization and the high growth rate it promoted induced a profound structural change of the Thai society, which is reflected in the reduction of poverty incidence, the change in employment structure, and the increase of income inequality. In 2013, absolute poverty headcount was close to 0% of the population

according to the PPP\$ 1.25 international poverty line of the World Bank, and 10% according to the national poverty line in 2013, down from respectively 17.2% and 65.2% in 1988 when the boom period kicked off⁴. The Gini coefficient of income inequality rose from 0.423 in 1962 to 0.527 in 2006 (Warr, 2009). Private sector employees, who accounted for 10% of total employment in 1969⁵ add up to 40% in 2014. Adding government employees puts the share of employees to about 50% of total employment. This is still low in comparison with rich countries where employees represent around 80% or more of employment. This increase in the wage-earners' share was prompted by a sharp decline of family helpers in the farm sector to 13% in 2014 down from 50% in 1969 and to a lesser extent by a decline of own-account farmers from 26% in 1969 to 18% in 2014. On the contrary, non-farm own-account workers' share grew from 5% to 15% of total employment over the period mostly because part of rural workers could not find a paid employment and turned self-employed in cities instead⁶. The major part of these urban own-account workers provides services to wage workers so that their income is very dependent on the overall level of wages. A minor part is composed of high skilled independent professionals (lawyers, physicians etc.) like in rich capitalist countries.

To summarize, these deep and durable changes in the employment structure show that wage labor, if not dominant, already impulses the dynamics of the national demand and justifies the application of a Post-Kaleckian theoretical model developed for the rich capitalist countries. To this aim, our article analyzes the impact of a change in labor income share on growth in a broad sense; that is whatever the source of the labor income, be it wage or non-wage. The objective is to observe the effect of a change in the labor share on growth over the long period (1970-2011), which saw an intense structural

change. We will also restrict the period under investigation to 1980-2011 when industrialization took off and a new working class of around 5 million blue collar workers in manufacturing and 12 million in the whole economy emerged⁷. These industrial workers, mostly concentrated in the Eastern seaboard of Thailand, have all the characteristics that Kalecki had in mind when he conceived a theoretical model where wages are the result of class struggle and bargaining. In the next section, we explain how we measure the labor share in various ways to either capture labor income in a comprehensive way or restrict it to wage earners only.

Measuring the labor share: the Thai case

Measuring the labor share always involves a degree of arbitrariness because the labor income stems from two categories of workers namely employees who earn a wage and own-account workers who earn a “mixed income” including both the returns on labor inputs and on capital investment. It is therefore necessary to estimate an adjusted labor share of income (ALS) that takes mixed income into account. In rich countries, where own-account work usually amounts to less than 10%, attributing the average compensation of employees to own-account workers (ALS₁) is common practice.

$$ALS_1 = [(Compensation\ of\ employees / Number\ of\ employees) * (Number\ of\ employees + Own-account\ workers)] / GDP\ at\ factor\ cost$$

In Thailand where it amounts to 33% in 2014, this adjustment leads to a strong bias because the vast majority of own-account workers are farmers or owners of small shops or street vendors in cities who usually earn less than the average wage. Most of them are non-registered or in other words are part of the informal economy. For these reasons, following Golin (2002) we calculated alternative ALS⁸:

$ALS_2 = (\text{Compensation of employees} + \text{Mixed income of own-account workers}) / \text{GDP at factor cost}$

$ALS_3 = \text{Compensation of employees} / (\text{GDP at factor cost} - \text{Mixed income})$

$ALS_4 = \text{Average of } ALS_2 \text{ and } ALS_3$

To be as comprehensive as possible, we test all these possible adjustments to check the sensitivity of our econometric results on the choice of the measure of the labor's share. ALS_4 is our preferred estimate because it avoids attributing all mixed income to the labor's share or hypothesizing that own-accounts workers have the same capital intensity than registered companies. Figure 1 presents the evolution of these labor shares in Thailand from 1969 to 2013.

Figure 1: Alternative measures of the labor's income share in Thailand, 1969 – 2013 here

Over the whole period ALS_1 shows no clear long-term trend. The other adjusted labor shares experienced a downward trend over the period. In 2011, ALS_4 was around 15% below its level of 1969.

The next section presents our theoretical model and tests the impact of a variation of these alternative labor shares of income on growth.

Theoretical Approach

The theoretical model employed for the analysis of the growth regime in Thailand is a new version of the model by Stockhammer et al. (2009), which is based on the model of Bhaduri and Marglin (1990). Stockhammer et al. (2009) aim to find the effect of income distribution on consumption (C), investment (I), and net exports (NX) and thus the total effect on aggregate demand (Y). Those demand components are functions of income (Y),

labor share (LS) and some control variables (denoted by z) which are assumed to be exogenous. Government expenditures (G) depend only on income. Then the aggregate demand can be written as:

$$AD = C(Y, LS) + I(Y, LS, z_1) + NX(Y, P, z_{NX}) + G(Y, z_G) \quad (1)$$

where, P is the (domestic) price level. The price level is also a function of wage share and other control variables. The prices considered in the model are domestic, export (P_x) and import (P_m) prices. Differentiation of the equation (1) with respect to LS and goods market equilibrium condition ($Y^* = AD$) gives:

$$\frac{dY^*}{dLS} = \frac{h_2}{1-h_1} \quad (2)$$

where, $h_1 = \partial C/\partial Y + \partial I/\partial Y + \partial NX/\partial Y + \partial G/\partial Y$ and $h_2 = \partial C/\partial LS + \partial I/\partial LS + \partial NX/\partial LS$. For the stability of the model, the multiplier $1/(1-h_1)$ should be positive. Then the sign of h_2 , called *private excess demand*, determines the sign of the total derivative. It gives the change in demand due to a change in income distribution at a fixed level of income. Its sign cannot be determined without an empirical investigation since the partial derivatives have different signs. $\partial NX/\partial Y$ is equal to $\partial X/\partial Y - \partial M/\partial Y$; however, since there is no effect of domestic income on the exports, the term reduces to $-\partial M/\partial Y$. Since the government sector is excluded from the model the term $\partial G/\partial Y$ disappears. Eventually, h_1 becomes $\partial C/\partial Y + \partial I/\partial Y - \partial M/\partial Y$. If dY^*/dLS turns out to be positive then the demand regime is wage-led; otherwise it is profit-led. For a given level of Y , the total effect of income distribution on the equilibrium demand can also be written as:

$$\frac{dY^*/Y}{dLS} = \frac{h_2}{1-h_1} \quad (3)$$

which gives the percentage change in the demand due to a one percent increase in the LS as $h_2 = \partial C/Y / \partial LS + \partial I/Y / \partial LS + \partial NX/Y / \partial LS$.⁹

In this framework an important distinction is the one between domestic and open economy. In the former, if the consumption is more sensitive to a variation of the labor share than the investment, then the economy is wage-led, otherwise profit-led. Here it is assumed that an increase in labor share promotes total private consumption and discourages investment. The increasing labor share is supposed to stimulate the consumption of the workers more than that of the capitalists.¹⁰ If the economy is domestically wage-led, the entire economy might or not be wage-led depending on the elasticity of exports to the unit labor costs and hence the labor share. However, if the domestic sector is profit-led, the entire economy is necessarily profit-led.

In order to find the effect of the labor income share on the national income, the GDP components and the prices (domestic and export) are modeled as separate equations by Stockhammer et al. (2009). While maintaining their analytical framework for the domestic economy, for the analysis of trade we opt for the approach by Mathis et al. (1988). These authors propose a framework of international competition which discriminates between price and non-price factors. We integrate some elements related to the international price competition. Thirlwall (2002), based on Kaldor (1970), also employs a similar exports function taking the price competitiveness into account (Hein, 2014, p. 148).

Regarding the domestic economy, Stockhammer et al. (2009) propose a consumption function of the form $C = f(W, R)$, where W is the labor income (or adjusted labor income) and R is the capital income (or adjusted operating surplus). It is expected that workers have a higher propensity to consume than profit earners. The investment is

modeled as $I=f(Y, R)$ in order to concurrently take into account the scale of the economy and the profitability. We employ the same functions in our model.

As for the trade equations, firstly exports and imports are estimated as separate equations but they are also treated together as a single net exports equation. The exports function proposed by Stockhammer et al. (2009) is of the form $X = f(Y_{for}, E, P_x/P_m)$, where Y_{for} is the main foreign trade partners' weighted GDP, E is the exchange rate and P_x/P_m is the ratio of export prices to import prices. The imports are modeled as $M = f(Y, E, P/P_m)$. The combination of the two functions is $NX/Y = f(Y, Y_{for}, E, RULC)$ where $RULC$ is the real unit labor costs and ULC the unit labor costs.

We employ the same imports function but we exclude the exchange rate variable in the trade equations since all the macroeconomic magnitudes are in constant dollars in our model. In other words, the exchange rate is implicitly present in the model. The exports function is different in two points: firstly, it takes into account the export prices P_x and that of the competitors P_x^{comp} , hence their ratio, which is the relative export prices P_x^{rel} .¹¹ This assumption is more appropriate since the importing countries compare the export prices of the exporting country by that of its competitors, not by the exporter's import prices. However, the impact of the import prices on the export prices is not neglected but captured via the domestic prices, which is also a function of unit labor costs. The domestic prices and P_x^{comp} determine the P_x . The second difference is that exports are a function of the total (weighted) imports¹² of the world, but not of the global GDP of the rest of the world. We do not use a net exports function.

As for the price equations, we employed the same domestic prices equation proposed by Stockhammer et al. (2009), which is modeled as $P = f(P_m, ULC)$. The export

prices are endogenized in our model in a price-maker-price-taker setting, as proposed by Mathis et al. (1988). Export prices are a function of the domestic prices and the weighted export prices of the competitors. The comparison of our model with that of Stockhammer et al. (2009) is in **Table 1**.

Table 1: Comparison of our model with that of Stockhammer et al. (2009) here

We estimated our model over the period 1970-2011 and the sub-period 1980-2011. Detailed information on the variables and the data sources is in the appendice. The motivation behind using a subsample after 1980s is threefold. The first reason is the impact of what Dutt (1996) calls the agriculture constraint. Less developed countries (LDCs) are constrained by a low-productivity agriculture, which despite being overstaffed finds it hard to supply enough food for the population. According to Dutt, the more the agriculture constraint is relaxed and the country industrializes, the more Keynesian policies become relevant for LDCs. In Thailand, employment in agriculture represented around 80% of total employment in 1970, around 70% in 1980 and was down to 40% in 2011¹³. Among those working in agriculture, unpaid family helpers amounted to around 50% of employment in agriculture in 1970, 42% in 1980, and was down to 17% in 2011 as many have left for jobs in industry or services which now accounts respectively for 19% and 40% of total employment. This tremendous process of structural change implies strong gains of labor productivity which was multiplied by 2.7 over the period 1970-2013 in agriculture, almost as much as in industry (2.8) and much more than in services (1.6)¹⁴. It should be mentioned that, although subsistence farming plays an important role for poor farmers, especially those living from upland agriculture, cash crop is dominant in the plain and has allowed farmers to also engage increasingly into wage labor. Less than a quarter

of rural people live exclusively from farming activities and around two thirds of their income is derived from off-farm activities (Walker, 2012). In 2013, the share of agriculture, industry and services in value added was respectively 9.5%, 43% and 47.5%¹⁵. All these elements indicate that Keynesian policies have become more applicable in Thailand in the course of time. In this respect, the analysis of the subsample that covers the last three decades is expected to give more reliable results in terms of applicability of our post-Keynesian model to Thailand.

The second reason is to detect if the growth regime has changed after 1980 when the neoliberal hegemony began to dominate and the income distribution to deteriorate on a global scale. However, this type of a subsample study does not econometrically correspond to testing regime shift (from profit-led to wage-led, or vice-versa). We resort to such an econometric analysis since the number of the observations is limited and division of the sample into two would not be sufficient to find robust results. A priori, we expect a more wage-led or less profit-led growth regime in the subsample of 1980-2011 compared to the full sample.

The third reason behind analyzing the subsample starting with 1980 is econometric. The Chow test suggests a structural break in some equations with some measures of the labor's income share at this year. This point will be explained in the section 4, which is dedicated to the econometric estimations of the model.

A review of empirical literature

There are two approaches to testing Bhaduri-Marglin type of wage-led-profit-led models. The first type analyzes consumption, investment, exports and imports (or net exports)

separately through single equations. Bowles and Boyer (1995) are the first to apply such a methodology to some developed countries. There is a vast literature on developed countries in this fashion. However, theoretical framework and equations vary. Among those, Naastepad and Storm (2006-7) examine eight OECD countries and conclude that the demand is wage-led in France, Germany, Italy, the Netherlands, Spain, and the United Kingdom, whereas profit-led in Japan and the USA. Hein and Vogel (2008), analyze Austria, France, Germany, the Netherlands, the UK and the USA. Stockhammer et al. (2009) apply the aforementioned model on the Euro area, considering it as a single country, and find that the whole area is wage-led.

The second type of models takes into account the interactions among the variables with the use of Vector Autoregressive Models (VAR). Gordon (1995a, 1995b) applies such a model, along with single equation estimations, to USA. Stockhammer and Onaran (2004) employ a structural VAR model in their analysis of the USA, the UK, and France where they test a set of hypotheses. Onaran and Stockhammer (2005) use a similar approach for South Korea and Turkey and find some evidence for wage-led regimes. More recently, Nishi (2012) examines the relationship among income distribution, debt ratio, and capital accumulation in Japan using a similar technique but a different model that distinguishes between debt-led and debt-burdened regimes. Hein (2014) provides an extensive literature review on both types of models along with the results of the analyses.

While most of the early literature focused on developed countries, a number of empirical studies have addressed the case of LDC recently. A pioneer work is that of Naastepad and Storm (2005) who analyzed the growth pattern regime of the East and the Southeast Asian countries. They build a different theoretical model derived from the

Kaldor-Verdoon relation and found that these countries are profit-led. In the case of Thailand, the profit-led character is due to a positive effect of a rise in profitability on investment while the effect on net exports is not relevant. Onaran and Galanis (2014) have also realized a comprehensive analysis of both rich countries and LDCs over the period 1960-2007.¹⁶ They use the theoretical model and methodology of Stockhammer et al. (2009) but carry it one step further. They conduct an empirical research on 16 of the G20 countries to analyze the interactions among countries calculating global multipliers. Their model enables the examination of the impact of a simultaneous change of the labor income share at a global level on individual countries. For LDCs, their results show that they are profit-led contrary to most of rich countries which are wage-led with the exception of Australia and Canada. The profit-led countries have in common to be relatively small economies and thus very open to foreign trade. China is a special case. Although it is the second largest economy of the world it is "... very strongly profit-led due to strong effect on exports and imports" (2012, op cit p 25). They conclude that the global economy is wage-led and in case of a worldwide race to the bottom in the labor share the global GDP contracts. Australia, China and South Africa are the only countries which maintain a positive but smaller growth. More recently, Molero-Simarro (2015) applies the Stockhammer et al. (2009) model on China for the period 1978-2007 and finds a negative effect of an increase of the profit share on consumption higher than the positive effect on investment. Over the whole period, the Chinese domestic economy is thus wage-led but when the positive effect of decreasing labor costs on net exports is taken into account the growth regime turns profit-led although of a lesser magnitude than in Onaran and Galanis'

study. We will compare our results with these but before the estimation procedure of the model equations is explained in the next section.

Estimation procedures and the Unit Root Tests

We firstly examined the stationarity properties of the series, in logarithm, via Augmented Dickey Fuller (ADF) test. The highest order of integration is found to be 1 (i.e. $I(1)$).

When all the series in the same equation are $I(1)$ we tested for cointegration among them via Engle-Granger (EG) method.¹⁷ When there was no cointegration, we ran an OLS in difference form. When all the variables in the same equation are stationary we applied the OLS method in differences, since we look for the short-run effects. We added autoregressive terms via Prais-Winsten (PW) method and pertinent dummy variables for the outliers when necessary. When the variables in the same equation are not of the same order, we employed Pesaran's (2001) Bounds test. Thus we can test cointegration among variables of different orders among which the maximum order of integration is 1¹⁸. When cointegration tests gave no sign of cointegration or were inconclusive, we applied the OLS method to the differences of the variables. As the model aims to capture the short-run dynamics between income distribution and the demand growth, lack of cointegration among the variables will not undermine the model.

After applying the relevant estimation technique, we check the robustness of the estimated equations by using the standard tests on residuals and coefficients. As for the residuals, we report DW test statistic and the probability values for White's heteroscedasticity test, the Autoregressive Conditional Heteroscedasticity (ARCH) test with one lag and the Doornik-Hansen normality test¹⁹. For the overall significance of the model and the parameters, probability values of the F-test, Chow²⁰, RESET test and CUSUM tests are presented. In

order to check for the multicollinearity among the regressors, we report the VIF (Variance Inflation Factor)²¹.

The ADF tests did not give straightforward results for the estimation of the equations. The unit labor costs and the price variables (except the domestic prices) turn out to be stationary and all the other variables are I(1) for the full sample at 5 % significance level. In the next section we present the estimation results based on the procedure that we applied.

Estimation of the model equations and results

Consumption

We firstly tested cointegration among consumption and labor and capital income series via EG method since the $\ln C$, $\ln W_i$ and $\ln R_i$ series are all found to be I(1) according to the ADF tests. As we detected no cointegration among the series, with four alternatives of labor and capital income, we estimated the consumption equation in first differences via OLS as in the form $\Delta \ln C = \text{constant} + e_{CW} \Delta \ln W_i + e_{CR} \Delta \ln R_i$, where i is from 1 to 4. e_{CW} and e_{CR} represent the labor income and profit elasticities of consumption, respectively. A priori, we expect e_{CW} the propensity to consume out of labor income, to be higher than e_{CR} , the propensity to consume out of profits, since workers spend a greater part of their income than profit earners. A shift of the income distribution in favor of labor will rise consumption expenditures. The higher the difference between e_{CW} and e_{CR} the higher the probability of the economy to be wage-led and vice-versa. Empirical research confirms that it is the case with a difference between the marginal propensities around 0.4, in accordance with the findings of the previous evidence as mentioned by Lavoie and Stockhammer, (2013, p 22-24), (see Table 2).

Table 2: Consumption Equation Estimations Here

e_{CW} is higher than e_{CR} for the four measures of income distribution ranging from 0.49 to 0.65, whereas those of e_{CR} are between 0.16 and 0.24²². ALS_1 , registers the highest difference between the two estimated elasticities (0.49) while for the three adjusted labor shares that include own-account workers, it is between 0.25 and 0.38. One reason may be that own-account workers have a lower propensity to consume (Tobin, 1971, p 84) either for precautionary motives due to the risky nature of their business or because they earn higher revenues and have a higher propensity to save like rich households and entrepreneurs. In order to estimate the impact of a change in income distribution on consumption for the period under consideration, we transform the elasticities into marginal effects and take the difference of them with the formula: $\partial C/Y / \partial LS = e_{CW}C/W - e_{CR}C/R$, where C/W and C/R are sample averages or the values of the corresponding ratios at a certain point of the time period considered. We obtain different results at the sample mean, at the beginning and the end of the period of the sample as seen in **Table 3**.

**Table 3: Change in Consumption due to a 1% increase of the Labor Income Share
here**

When the whole sample is considered, the effect is positive for ALS_1 , which imputes the average compensation to own-account workers, and negative for the three other adjustments which include the income of own-account workers. It is suggested that a 1% increase of the labor income share leads to a 0.24% rise of consumption when ALS_1 is considered and a decrease of consumption ranging from 0.07 to 0.42% for the other adjusted labor shares. The reason is that in the last three cases, the labor income hike leads to a decline of capitalists' consumption of a greater magnitude than the rise of workers'

consumption. Conversely, an increase of the profit share would induce a rise of consumption. This confirms that as far as consumption is concerned, demand is profit-led in Thailand when own-account workers' income is taken into consideration. We observe that a redistribution of income in favor of labor is more likely to raise consumption at the end of the period which means that consumption is getting more wage-led.

The possibility of such a phenomenon, though in contradiction with the a priori hypothesis $\partial C/\partial LS > 0$, has recently been discussed within the Post Keynesian framework by Stockhammer and Stehrer (2011) and Kapeller and Schütz (2015). The former authors, in their empirical analysis based on the Goodwin and Kalecki models, name occurrence of a such effect as 'perverse consumption differential' and observe it in the UK, Ireland, Australia and the USA. They state that their framework does not explain this phenomenon but add that missing variables might be the underlying reason. They suggest that e.g. strong wealth effects in consumption might engender such a case. The latter authors develop the 'perverse effects' on theoretical grounds drawing from the 'conspicuous consumption' concept of Veblen. They show, in two different cases, that, a decrease in the labor's income share might have different impacts within the labor class if the class is composed of heterogeneous workers. In their model, in which the labor class is composed of two types of workers, a decrease in the labor's income share is only passed on one type of the workers (type 2), while the other's share stays constant (type 1). In such a setting, the type 2 workers, facing a reduction in their wages, try to keep up with the consumption levels of the type 1 workers through increasing their consumptions with or without debt burden. Thus the relative consumption concerns of the type 2 workers might lead to two cases of consumption-driven profit-led regimes.

Some features of the income distribution in Thailand fit well with these arguments. Our findings might be a sign of such a segregation within the labor class for instance between those working in the formal economy which enjoy usually higher income and those working in the informal economy. More broadly, the income inequality is high with a Gini coefficient of income around 0.5 (Jitsuchon, 2014, p. 5) and households are highly indebted to maintain or improve their level of consumption in particular of durable goods such as housing and cars. For the richer households, a wealth effect of 0.02 to 0.03 was estimated for 2010 which was of the same magnitude as countries like the USA, Italy or Spain (Rungcharoenkitkul, 2011). This could explain the perverse effect in consumption once mixed income is included in the estimate of the labor's share. These characteristics are possible candidates to explain the observed profit-led pattern in consumption but further investigation of the personal distribution of income in Thailand is required to confirm their macroeconomic effects on demand.

Investment

The $\ln I$, $\ln Y$, and $\ln R_i$ series are $I(1)$ according to the ADF tests. Since the cointegration tests did not give significant results, we estimated a difference equation instead, as $\Delta \ln I = \text{constant} + e_{IY} \Delta \ln Y + e_{IR} \Delta \ln R_i$ where i is from 1 to 4. e_{IY} and e_{IR} represent the income and profit elasticities of investment, respectively. We estimated the equations with a dummy variable controlling for the Asian financial crisis of 1997²³. This variable captures the sharp fall in investment after the 1997 crisis, which constitutes an outlier of the growth rate of the $\ln I$ series. The results of the regressions for the four labor income shares are shown in **Table 4**.

Table 4: Investment Equation Estimation here

The results demonstrate that e_{IY} lies in the range 2.12-2.40. However, e_{IR} is insignificant for the four alternative measures of profits. The a priori hypothesis on the positive impact of profits on investment is not validated. This result is not surprising when compared to those found on developing countries in the literature. Onaran and Galanis (2014) find no significant impact of profit share on private investment in several developing countries like China, India, and Turkey. As for China, they note that Molero-Simarro (2015) and Wang (2009) find a significant positive effect of profits on total investment. It is mentioned that the objectives of the state and private enterprises are different, although an increase in profits would provide more funds for financing investment. It should also be noted that financialization, which is not taken into account in our model, plays an important role in the relation between profits and investment. Onaran et al. (2011), in their article on the USA, find a positive significant effect of the former on the latter, after deducting the interest and dividends from the gross operating surplus. The insignificance of the profits in the investment function is in line with the statement of Bhaduri and Marglin that “investment, particularly in long-lived fixed capital equipment, is likely to respond more cautiously to a change in profit margin/share compared to consumption” (1990, p. 385).

Exports

The ADF tests show that $\ln X$, $\ln M_{w1}$ and $\ln M_{w2}$ series are I(1); however, $\ln P_{xrel}$ turns out to be stationary. Since the variables are integrated of different orders we applied Bounds test. This test rejected cointegration among the exports, the total world imports (of the two alternative measures) and the relative export prices series. Consequently, we estimated a difference equation instead of the form $\Delta \ln X = \text{constant} + \beta \Delta \ln M_{wj} + \kappa \Delta \ln P_{xrel}$, where j is the

index for the two measures of the world imports. β and κ represent the world imports and the price elasticities of the exports, respectively. The results of the regressions are in **Table 5**.

Table 5: Exports Equation Estimations here

We obtain identical results with the two alternative measures of the world imports. The coefficients have almost the same magnitudes and they are highly significant. The growth of the world demand, measured by a simple or weighted sum of the exports of Thailand, by 1% leads to 0.3 % growth in the exports of Thailand. The impact of international price competition is more substantial. A 1% increase of the relative prices of the exported products shrinks the exports by around 0.7 %.

Imports

The imports equation has similar characteristics with the exports in terms of econometric properties of the variables. $\ln M$ and $\ln Y$ are $I(1)$ but $\ln P/P_m$ is stationary. Pesaran's (2001) Bounds test shows no sign of cointegration. We estimated the equation in difference form as $\Delta \ln M = \text{constant} + \rho \Delta \ln Y + \gamma \Delta \ln P/P_m$ where ρ and γ are the income and (relative) price elasticities of imports, respectively. The results of the regression is displayed in **Table 6**.

Table 6: Imports Equation Estimations here

Both coefficients are highly significant. A 1% increase in domestic demand raises imports by 1.67%. The imports are even more sensitive than the exports to the relative prices: an increase of P/P_m by 1% tends to increase the imports by around 0.9%. This high sensitivity to the price of imported goods can be explained by the share of import content of exports which has increased recently. Whereas the import content of export was 12% in

1995, it more than doubled reaching 30.1% in 2008 because of the growing importance of electronics and automobile components which are part of global value chains (Poonpatibul et al. 2009, p 17-18). This is a strong constraint on a stimulus policy of domestic demand. However, this dependence of a part of the imports to exports, is not taken into consideration by our model. Stockhammer et al. (2011) employ an income distribution-growth model, for Germany, into which the import content of the exports is integrated. Whenever the exports decline, e.g. due to an increase of the export prices, imports of some goods, majorly the semi-finished products, are expected to decline accordingly. Integrating this dimension into the income distribution-growth models prevents the overestimation of the impact of the labor income share on net exports.²⁴

Domestic Prices

The ADF test indicates that $\ln P$ series are non-stationary, but the two explanatory variables $\ln P_m$ and the four measures of $\ln ULC$ are stationary. We estimated a difference equation as $\Delta \ln P = \text{constant} + \eta \Delta \ln ULC_i + \mu \Delta \ln P_m$, where i takes values from 1 to 4 according to the alternative measures of income distribution. η and μ are the elasticities of unit labor costs and import prices of the domestic prices, respectively. We included two dummy variables in the regressions in order to control for the 1973 petrol crisis²⁵ and the 1997 Asian financial crisis, which had unprecedented inflationary and deflationary effects on the evolution of the domestic prices in Thailand, respectively. Addition of the dummy variables also enabled correction of heteroscedasticity that arose due to the two crises. We present the estimation results in **Table 7**.

Table 7: Domestic Prices Equation Estimations here

The estimations display the variability of the significance and magnitude of the

coefficients depending on the unit labor cost measure, which depends on the type of adjustment. The coefficient η is in the range 0.55-0.67, while η is not significant with respect to the first type of labor income adjustment and lies between 0.17-0.19²⁶. The dummy variables reflect the impact of the drastic price increases and decreases, while in some specifications they are not significant at 5%.²⁷ Chow test suggests that there is a structural break at 1980.

Export Prices

As already stated, ADF test indicates that $\ln P$ series are non-stationary; however, the $\ln P_x$ and $\ln P_x^{comp}$ series are stationary. We estimated a difference equation as $\Delta \ln P_x = \text{constant} + \lambda \Delta \ln P + \tau \Delta \ln P_x^{comp}$, where λ and τ are the relevant elasticities. The estimations are reported in **Table 8**.

Table 8: Export Prices Equation Estimations here

Since the 1973 petrol crisis ceiling the export prices, we added the dummy variable, which is already used in the domestic price regressions. Addition of this variable not only solved the heteroscedasticity problem, but also being highly significant, it displays the inflationary impact of the petrol shock on the export prices.²⁸ The results show that a 1 % increase of the domestic prices leads to a 0.31 % increment of the export prices while the effect of the foreign export prices on the latter is 0.41 %. These empirical findings suggest that Thailand is a price-taker country since τ is higher than λ . As in the domestic prices equation, a structural break is present at 1980.

In the next section we combine the theoretical model with the estimations of the coefficients obtained from the regressions in order to characterize the growth regime of Thailand.

Calculation of the Effect of Income Distribution on Growth

The overall effect on an increase of the labor income share on economic growth is by the multiplier in the equation 3, as mentioned in the section on the theoretical framework. We used the coefficients (elasticities) extracted from the regressions and the sample (1970-2011) mean of the related ratios for the period considered in the calculations. The model implies that the sign of the private excess demand (h_2) characterizes the growth regime and h_1 determines its magnitude.

The first element of the h_1 is the marginal effect $\partial C/\partial Y$, which is equal to the multiplication of e_{CY} , the elasticity of C with respect to Y , and the sample average of the ratio of C to Y . e_{CY} is not directly derived from the regressions. Stockhammer et al. (2009) simply use the sum of e_{CR} and e_{CW} for e_{CY} , since the consumption function is of type Cobb-Douglas; however, Onaran and Galanis (2014) calculate a weighted sum $e_{CR}(R/Y) + e_{CW}(W/Y)$, where R/Y and W/Y are sample averages of shares of capital and labor income, respectively. Since the weighted sum, which underestimates the income elasticity, is always lower than e_{CW} , we opt for the former approach.²⁹ The second and the third elements $\partial I/\partial Y$ and $\partial M/\partial Y$ are equal to the multiplication of the elasticities that are directly obtained from the regressions and the sample averages of the relevant ratios.

As for the calculation of h_2 , $\partial I/Y / \partial LS$ is equal to $-e_{IR}(I/R)(Y_f/Y)$. $\partial X/Y/\partial LS$ is calculated by the formula $[\kappa\lambda\eta/(1-\eta)](X/Y)/LS$.³⁰ In the same manner, $\partial M/Y/\partial LS$ is calculated as $[\gamma\eta_C/(1-\eta)](M/Y)/LS$.³¹ The effect of a 1% increase in the labor income share on the net exports is shown in **Table9**

Table9: Total Effect of a 1% increase of the labor income share on demand for the full sample (1970-2011)

The results clearly indicate that the economy is profit-led with respect to four

different measures of the labor income share. The effect of a 1% increase in the labor income share shrinks the GDP by around 2 % for most of the adjusted labor income shares. In the case of ALS_2 , the decline in GDP approaches to 3%. Our final results show that the total effect of a change in the distribution of income is the highest found until now by the literature. In the case of China, which is also an example of an export-led economy, Galanis and Onaran (2014, op cit) using what we called ALS_1 in our article found that an increase of 1% of the profit share has a total effect of 1.57% on growth, the highest total effect of their sample while Molero-Simarro(2015, op cit) found a small total effect of 0.011%. Our results are robust to various estimates of the labor income share and reveals the strong dependency of Thailand on foreign markets due to its high export (45%) and import (52%) to GDP ratios³² and its sensitivity to price competitiveness in the past decades. These characteristics of a small open economy combine to explain that the profit-led character of Thailand depends above all on the strong negative effect of a change in the labor income share on net exports (for instance -1.29, with respect to ALS_1) and in particular on imports (1.07, again with respect to ALS_1) which reflects the limit of the development model of Thailand. Future research should explore further this topic and bring more insights to give a comprehensive explanation of the dependence of Thailand on imports.

A Sub Period Analysis: 1980-2011

As mentioned above, analyzing the sub-period 1980-2011 enables cross checking the results obtained for the entire sample. Due to space limitations, we skip the intermediate stages of the econometric investigation and present the results in **Table 10**.

Table 10: Total Effect of a 1% increase of the labor income share on demand for the subsample (1980-2011)

As for the consumption function, we obtain similar results as in the analysis of the entire

sample. However, globally, the negative effects are smaller in absolute value for ALS_2 to ALS_4 and the positive effects are higher for ALS_1 . This reflects the greater influence of wage labor in the economy and confirms that demand is becoming less profit-led. Still, we cannot claim a regime shift after 1980. The results of the regressions are almost identical for the investment functions. The trade equations, except for the calculations based on ALS_1 , point that the export-led pattern is still present but weaker. The overall character of the growth regime persists to be profit-led, however, a one percent increase of labor income share results in a 1 to 1.5 % decrease of the GDP at market prices, except for ALS_1 which gives an identical result as in the entire sample. Overall, the results validate our expectations of a weaker profit-led regime.

Conclusion and Policy Implications

This article explored the possibility to rebalance the Thai growth with a policy of domestic market stimulus based on an increase of the labor income share. Our investigation shows that, other things being equal, such a policy would lead to a short-term decrease of the GDP of around 2% because the demand regime is profit-led: an increase in the labor share has a strong and negative impact on net exports which is not offset by a positive impact on consumption while it has no effect at all on investment. This result is in accordance with the conclusions of other researches on East Asian countries and more generally on small open economies (Onaran and Galanis, 2013). In our case, it can be explained by the features of the Thai economy, which combined a relatively small domestic market and a large export sector. The Thai industrial apparatus is geared towards exports, especially the industrial companies that are part of global value chains. For these companies, which include many subsidiaries of multinationals, wages are most of all viewed as a cost and

not primarily as a source of domestic demand. A wage hike will not increase the sales of computers, cell phones or TV screens, by much in Thailand and therefore investment in these sectors. However, it will impact more significantly the cost of production and hence the competitiveness of Thai exports. This illustrates a point made by Lavoie and Stockhammer (2013, 19-20): the income distributional policy must be consistent with the economic regime of the economy. A single policy of labor share increase in a profit-led economic regime is bound to fail. This does not mean that the Thai growth regime can be maintained without any change. The results of the econometric analysis must be interpreted with caution as regards the policy implications. The profit-led character reflects the structure of the Thai economy and can be seen as a historical resume of the co-evolution of the labor share and the output level of Thailand. The econometric results cannot be extrapolated by suggesting that a continuous decline of the labor's share due to income suppression will have the same positive impact on net exports in the short or long run. Moreover, partial dependence of the imports to exports, which is not integrated into our model, overestimates the profit-led character of the economy. In a future research, this aspect should be taken into account.

The investment function deserves to be discussed in depth from a theoretical point of view. The model does not take into account the accumulation of capital, which is employed in a typical Kaleckian investment function, and its long-term effects. However, since our research is restrained to short-term demand growth, using such an investment function is not inconsistent. It might be argued that the series span a too long period for estimation of a short-term model. If monthly or quarterly data series were available, the equations could have been estimated for much shorter periods, in terms of years, since the

number of observations would increase. Then the econometric estimations would have been much more consistent with the theoretical model. Another point to be addressed is financialization, especially issues concerning household debts and rentiers, who receive dividends and interest payments. These elements are also important for determination of consumption. Integration of rentier class in the model would be more complete for consumption and investment functions, as in the study by Onaran et al. (2011). However a problem arises: such data is hard to come by for developing countries like Thailand. Last but not least, the structural change is not captured by the investment function. The industrial policies led by the state, e.g. industry-specific credits, might have short and long term impacts on investment decisions. While not ignorable, these issues should be addressed and integrated in a more in-depth research within the post-Keynesian framework.

Despite these limitations, our article points to the need for change. The export-led growth pattern of Thailand may have been coherent with the global economy in the past, but the uncertain recovery of the 2008-09 international crisis, the emergence of new low-cost competitors of Thailand, and the slowdown of China's growth show that the global economy is no more supportive of ever increasing export sales. In these new circumstances, an export-led growth economy like Thailand must consider rebalancing its growth because one cannot imagine that an ever decreasing labor income share will be the solution.

The real solution is to rebalance the Thai economy away from export and towards the domestic market by implementing a broad set of economic and social policies that will change the overall structure of the economy. The objective is to shift from a profit-led to a

wage-led economy based on the domestic market. However, our results show that a mere wage-policy is not sufficient to achieve this goal and should be accompanied by policies aiming structural change in favor of promoting domestic market.

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Appendix

Data sources

Database	Institution	Date of Access	Note
PWT 8.0: Penn World Table version 8.0	Center for International Comparisons of Production, Income and Prices, University of Pennsylvania and University of Groningen	September 2013	Prepared by Feenstra et al. (2013)
CHELEM: International trade flows, balances of payments and world revenues	CEPII : <i>Centre d'Etudes Prospectives et d'Informations Internationales</i> (France)	April 2014	We used the CHELEM International Trade Database
WDI: World Development Indicators	WB: World Bank	April 2014	
NIPA: National Income and Product Accounts of Thailand	NESDB: National Economic and Social Development Board of Thailand	January 2015	Calculations are based on the article by Jetin (2012) and updated in 2015 by him.
Labor Force Survey	National Statistical Office (NSO) of Thailand	January 2015	For long-term consistency, all employment data are from the third quarter of each year.

All data used in the article are annual over the 1970–2011 period.

Variables

C, I, X, M, Y : In constant 2005 dollars and retrieved from the WDI database.

W, R : Adjusted sum of labor and capital incomes are calculated by multiplying the adjusted labor share by the GDP at factor costs in constant dollars.

$P_x, P_x^{comp}, P_{xrel}$ and P_m : Normalized export and import price indices of Thailand and its

competitors are from the PWT 8.0 database. P_x^{comp} is the weighted price index of the trade partners of Thailand, where the weights are the shares of exports of Thailand to the countries in its total exports. P_x^{rel} is simply the ratio of P_x to P_x^{comp} .

M_w : We used two alternatives for the world demand. The first one, denoted as $M_{w1} = \sum_i^N \alpha_i M_i$, where α_i is the share of exports of Thailand towards the country i , i.e. $\alpha_i = \frac{X_i}{\sum_i^N X_i}$, and M_i is the total imports of the country i . Alternatively, a simple sum of the imports of the rest of the world, denoted as $M_{w2} = \sum_i^N M_i$, is used in the estimations.

Unit labor costs

Unit labor costs (*ULC*) is the ratio of the nominal compensation of workers to real output, i.e. real GDP at market prices. We obtain the real unit labor cost (*RULC*) if the labor compensation is also in real terms. The *RULC* and the *LS* are slightly different. While the former is the ratio of the real labor compensation to real GDP at market prices (Y), the latter is the share of the (real) labor compensation in (real) GDP at factor costs (Y_f).

Price deflator

The price deflator P used in the estimations is not the one calculated in local currency (bahts) but its conversion into constant 2005 dollars. It is equivalent to multiplication of the domestic price deflator by PPP_{2005} , the Purchasing Power Index for 2005 and its division by E , the exchange rate. Then it is normalized such that its value in 2005 is equal to 1. This deflator is then used to calculate the unit labor costs.

Derivation of Multipliers

The impact of *LS* on exports is found indirectly through combining the domestic price, export price and exports equations. At the first stage, replacing *ULC* by its definition *P.LS*. Y_f/Y in the domestic price equation, we obtain the following reduced equation:

$$\ln P = \text{constant} + \eta_c / (1 - \eta_c) \cdot \ln LS + \eta / (1 - \eta) Y_f / Y + \mu / (1 - \eta) \ln P_m$$

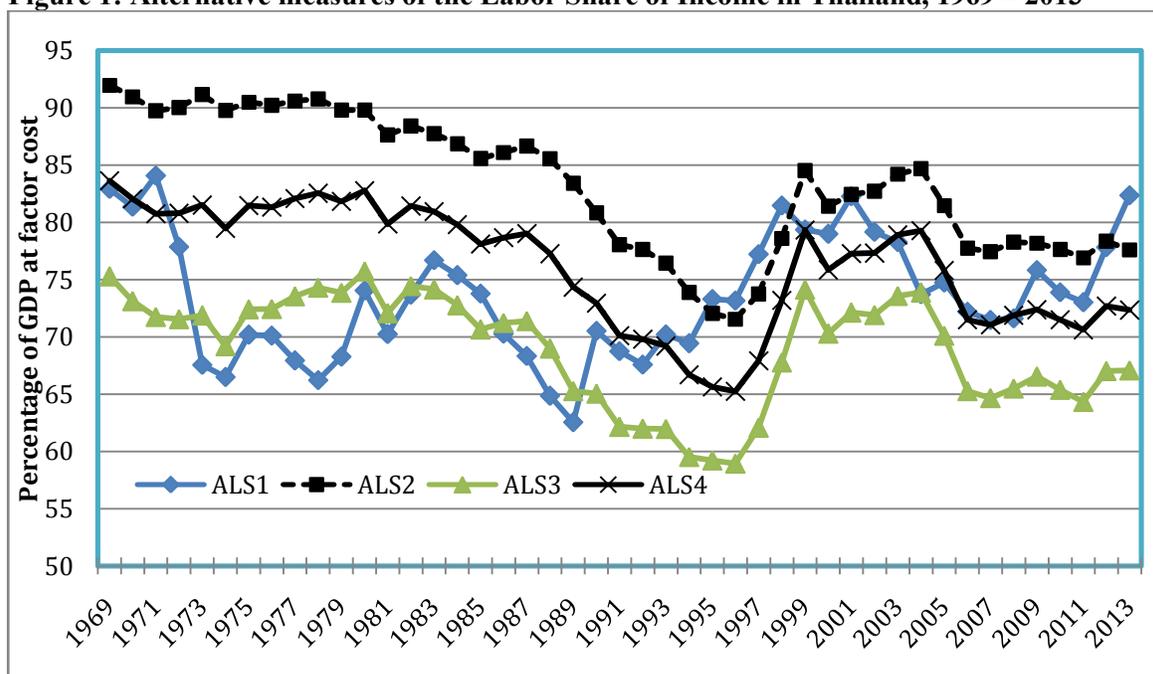
Secondly, we replace this reduced equation in the export prices equation and obtain another reduced equation:

$$\ln P_x = \text{constant} + \lambda\eta_c/(1-\eta)\ln LS + \lambda\eta/(1-\eta) Y_f/Y + \lambda\mu/(1-\eta) \ln P_m + \dots$$

Finally replacing this equation in the exports equation and taking the partial derivative of X with respect to LS gives us the multiplier formula $[\kappa\lambda\eta/(1-\eta)]X/LS$. Dividing this multiplier by Y we obtain $\partial X/Y/\partial LS$. The imports multiplier $\partial M/Y/\partial LS$ is derived in a similar way.

Tables and Figures

Figure 1: Alternative measures of the Labor Share of Income in Thailand, 1969 – 2013



Source: Authors' calculations with data from NESDB and NSO (Employment, third quarter)

Table 1: Comparison of our model with that of the Stockhammer et al. (2009)

Dependent Variable	Stockhammer et al. (2009)	Our model
Consumption	$C = f(W, R)$	$C = f(W, R)$
Investment	$I = f(Y, R)$	$I = f(Y, R)$
Exports	$X = f(Y_{for}, E, P_x/P_m)$	$X = f(M_w, P_x/P_x^{comp})$
Imports	$M = f(Y, E, P/P_m)$	$M = f(Y, P/P_m)$
Net Exports	$NX/Y = f(Y, Y_{for}, E, RULC)$	-
Domestic Prices	$P = f(P_m, ULC)$	$P = f(P_m, ULC)$
Export Prices	$P_x = f(P_m, P)$	$P_x = f(P, P_x^{comp})$

Notes: M_w are the two versions of total imports of the world. See the appendix for the details. Since the labor shares are calculated in different ways, we have four alternative series of W, R and ULC , i.e. i is from 1 to 4.

Table 2: Consumption

Dependent variable: $\Delta \ln C$ Regressors	i=1		i=2		i=3	
	Coefficient	t-ratio	Coefficient	t-ratio	Coefficient	t-ratio
Constant	0	0.69	0.01	1.11	0.01	1.19
$\Delta \ln W_i$	0.65***	9.05	0.55***	6.66	0.49***	6.27
$\Delta \ln R_i$	0.16***	7.92	0.17***	5.96	0.24***	6.85
Diagnostics						
R^2	0.76		0.69		0.69	
Adjusted R^2	0.74		0.67		0.67	
DW statistic	1.87		1.76		1.75	
Heteroscedasticity test	0.72		0.05		0.71	
ARCH test (1 lag)	0.94		0.17		0.22	
Normality test	0.61		0.52		0.89	
F-test	0.00		0.00		0.00	
Chow test (Break at 1980)	0.05		0.22		0.27	
RESET test (with squares)	0.22		0.07		0.05	
CUSUM test	0.82		0.89		0.99	
Highest VIF	1.05		1.00		1.00	

Notes: ***, ** and * represent 1, 5 and 10 % of significance levels, respectively.

Table 3: Change in Consumption due to a 1% increase in the Labor Income Share

	ALS1	ALS2	ALS3	ALS4
1970	-0.03	-1.23	-0.22	-0.51
Mean	0.24	-0.42	-0.07	-0.20
2011	0.22	-0.02	0.06	0.01

Table 4: Investment Equation

Dependent variable: $\Delta \ln I$ Regressors	i=1		i=2		i=3	
	Coefficient	t-ratio	Coefficient	t-ratio	Coefficient	t-ratio
Constant	-0.07	-4.45	-0.07	-4.47	-0.07***	-4.31
$\Delta \ln Y$	2.40***	9.44	2.12**	8.32	2.14***	7.89
$\Delta \ln Ri$	-0.07	-1.23	0.12	1.54	0.11	1.01
D1997-1998	-0.20***	-4.56	-0.18***	-3.89	-0.18***	-3.90
ρ^a						
Diagnostics						
R^2	0.89		0.89		0.90	
Adjusted R^2	0.88		0.88		0.88	
DW statistic	1.72		1.72		1.75	
Heteroscedasticity test ^b	0.21		0.51		0.02	
ARCH test ^b (1 lag)	0.51		0.25		0.29	
Normality test ^b	0.28		0.07		0.10	
F-test ^b	0.00		0.00		0.00	
Chow test ^b (Break at 1980)	0.53		0.43		0.46	
RESET test ^b (with squares)	0.13		0.12		0.11	
CUSUM test ^b	0.09		0.07		0.08	
Highest VIF	2.08		2.13		2.34	

Notes: ***, ** and * represent 1, 5 and 10 % of significance levels, respectively.

a. ρ is the parameter of PW method.

b. Probability values of the corresponding tests

Table 5: Exports Equation

Dependent variable: $\Delta \ln X$ Regressors	j=1		j=2	
	Coefficient	t-ratio	Coefficient	t-ratio
Constant	0.06***	4.41	0.06***	3.35
$\Delta \ln M_{w_j}$	0.30***	2.9	0.30***	3.15
$\Delta \ln P_x^{\text{rel}}$	-0.67***	-2.93	-0.66***	-3.28
AR2			0.35**	2.26
Diagnostics				
R^2	0.26		0.32	
Adjusted R^2	0.23		0.28	
DW statistic	1.91		1.80	
Heteroscedasticity test ^a	0.38			
ARCH test ^a (1 lag)	0.45		0.25	
Normality test ^a	0.28		0.77	
F-test ^a	0.00		0.00	
Chow test ^a (Break at 1980)	0.12			
RESET test ^a (with squares)	0.07			
CUSUM test ^a	0.96			
Highest VIF	1.06		1.04	

Notes: ***, ** and * represent 1, 5 and 10 % of significance levels, respectively.

a. Probability values of the corresponding tests

Table 6: Imports Equation

Dependent variable: $\Delta \ln M$		
Regressors	Coefficient	t-ratio
Constant	-0.01	-0.58
$\Delta \ln Y$	1.67***	4.51
$\Delta \ln P/P_m$	0.91***	3.91
Diagnostics		
R^2	0.63	
Adjusted R^2	0.61	
DW statistic	2.25	
Heteroscedasticity test ^a	0.62	
ARCH test ^a (1 lag)	0.89	
Normality test ^a	0.59	
F-test ^a	0.00	
Chow test ^a (Break at 1980)	0.94	
RESET test ^a (with squares)	0.23	
CUSUM test ^a	0.58	
Highest VIF	1.25	

Notes: ***, ** and * represent 1, 5 and 10 % of significance levels, respectively.

a. Probability values of the corresponding tests

Table 7: Domestic Prices Equation

Dependent variable: $\Delta \ln P$	i=1		i=2		i=3		i=4	
Regressors	Coefficient	t-ratio	Coefficient	t-ratio	Coefficient	t-ratio	Coefficient	t-ratio
Constant	0.01	1.58	0	1.3	0.01*	1.76	0.01	1.59
$\Delta \ln ULC_i$	0.63***	6.13	0.67***	10.6	0.55***	7.77	0.60***	9.03
$\Delta \ln P_m$	0.11	1.12	0.17**	3.07	0.19***	2.3	0.18**	2.31
D1973-1974	0.09***	3.42			0.06**	2.13	0.05*	1.91
D1997-1998	-0.09***	-3.16	-0.07***	-2.77	-0.11***	-4.01	-0.09***	-3.48
ρ^a			0.30		0.23		0.30	
Diagnostics								
R^2	0.84		0.91		0.88		0.90	
Adjusted R^2	0.83		0.90		0.87		0.89	
DW statistic	2.11		1.80		1.95		1.93	
Heteroscedasticity test ^b	0.38							
ARCH test ^b (1 lag)	0.70		0.78		0.35		0.57	
Normality test ^b	0.20		0.71		0.78		0.77	
F-test ^b	0.00		0.00		0.00		0.00	
Chow test ^b (Break at 1980)	0.03							
RESET test ^b (with squares)	0.00							
CUSUM test ^b	0.86							
Highest VIF	2.09		2.04		1.75		1.91	

Notes: ***, ** and * represent 1, 5 and 10 % of significance levels, respectively.

a. ρ is the parameter of PW method.

b. Probability values of the corresponding tests

Table 8: Export Prices

Dependent variable: $\Delta \ln P_x$					
Regressors	Coefficient	t-ratio	Coefficient	t-ratio	Coefficient
Constant	0.01	0.65	0.01	1.06	0.00
$\Delta \ln P$	0.42***	3.32	0.31***	2.89	0.42***
$\Delta \ln P_x^{\text{comp}}$	0.51***	3.16	0.41***	3.1	0.39***
D1973-1974			0.13***	4.39	0.12***
D1997-1998					0.05
Diagnostics					
R^2	0.65		0.77		0.78
Adjusted R^2	0.63		0.75		0.75
DW statistic	1.74		1.64		1.72
Heteroscedasticity test ^a	0.03		0.71		0.74
ARCH test ^a (1 lag)	0.98		0.72		0.56
Normality test ^a	0.05		0.29		0.39
F-test ^a	0.00		0.00		0.00
Chow test ^a (Break at 1980)	0.00		0.00		0.00
RESET test ^a (with squares)	0.00		0.02		0.03
CUSUM test ^a	0.40		0.10		0.08
Highest VIF	1.97		2.09		3.67

Notes: ***, ** and * represent 1, 5 and 10 % of significance levels, respectively.

a. Probability values of the corresponding test

Total 9: Total Effect of a 1% increase of the labor income share on demand for the full sample (1970-2011)

	ALS1			ALS2			ALS3			ALS4		
	1970	Mean	2011									
Consumption	-0.03	0.24	0.22	-1.23	-0.43	-0.02	-0.22	-0.07	0.06	-0.51	-0.20	0.01
Investment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Exports	-0.08	-0.22	-0.40	-0.08	-0.22	-0.45	-0.06	-0.16	-0.32	-0.07	-0.18	-0.37
Imports	0.51	1.07	1.09	0.46	1.14	1.04	0.57	0.84	1.24	0.51	0.95	1.13
Net Exports	-0.59	-1.29	-1.50	-0.54	-1.36	-1.48	-0.63	-1.00	-1.57	-0.58	-1.13	-1.50
Private excess demand	-0.62	-1.05	-1.27	-1.77	-1.80	-1.51	-0.85	-1.07	-1.50	-1.08	-1.33	-1.49
Total effect	-1.59	-1.98	-1.23	-3.76	-2.63	-1.54	-1.59	-1.62	-1.07	-2.24	-1.95	-1.25

Total 10: Total Effect of a 1% increase of the labor income share on demand for the subsample (1980-2011)

	ALS1			ALS2			ALS3			ALS4		
	1980	Mean	2011									
Consumption	0.46	0.43	0.40	-0.99	0.07	0.07	-0.28	-0.01	0.09	-0.51	-0.12	0.03
Investment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Exports	-0.08	-0.18	-0.30	-0.05	-0.11	-0.20	-0.03	-0.10	-0.14	-0.04	-0.11	-0.18
Imports	0.54	1.48	1.09	0.44	0.89	1.09	0.44	0.79	1.04	0.48	0.85	1.13
Net Exports	-0.62	-1.67	-1.40	-0.49	-1.00	-1.29	-0.48	-0.89	-1.18	-0.52	-0.96	-1.31
Private excess demand	-0.16	-1.24	-0.99	-1.48	-0.94	-1.22	-0.76	-0.90	-1.08	-1.03	-1.08	-1.28
Total effect	-1.02	-1.95	-1.25	-2.45	-1.08	-0.94	-1.12	-1.11	-0.63	-1.67	-1.28	-0.87

Notes

¹ In current prices Atlas method (for further details, see World Development Indicators, the World Bank).

² Over the period 1970-1985, the ratio of private investment to GDP was on average 20.3% and 27.3 % for total GFCF. During the boom period (1986-96) it was respectively 29.5% and 36.8%. After the Asian crisis (1997-98) and over the period 1999-2013, it fell to respectively 15.5% and 21.4%. Authors' calculations with data from NESDB.

³ Over the same period (average of 2010-2013), the share of industry (which includes mining, manufacturing and utilities) in GDP was 42% in China, deemed as the factory of the world, 35% in Indonesia the biggest economy of ASEAN and 33.3% in the whole South-East Asia (source: United Nations, National Accounts Main Aggregates Database, GDP and its breakdown at constant 2005 prices in US dollars).

⁴ Source: World Development Indicators, the World Bank.

⁵ 1969 is the first year for which detailed data is available. Source: National Statistical Office of Thailand, Labor Force Survey, various years. For data consistency we used the third quarter of each year, which was the sole available in the early years.

⁶ Source: Authors' estimations with data from the Labor Survey of the National Statistical Office (NSO) of Thailand, various issues.

⁷ Source: authors' estimates with NSO data.

⁸ A methodological note detailing data issues, estimates of the adjusted labor shares and econometric results is available on request to the authors.

⁹ The empirical calculations will be based on this version of the private excess demand.

¹⁰ Our empirical findings in the next section show that this is not the case for all but one measures of the labor's share that we calculated.

¹¹ Thirlwall (2002, chap 4) employs a similar exports function. He uses domestic prices foreign prices ratio instead of relative export prices. Ederer (2008) employs the same exports function as ours, however, export prices are a function of domestic and imports prices in his model, while in our model the export prices depend on along with domestic prices, (weighted) export prices of competitor countries instead of import prices.

¹² Razmi (2005) also uses a weighted sum of world imports instead of world income in the estimation of the exports equation in order to test the Balance of Payments Constrained Growth Model for India.

¹³ Authors' estimations with data for employment by industry taken from the National Statistical Office of Thailand. We use data from the third quarter of each year for consistency over the period and to avoid seasonal fluctuations.

¹⁴ Labor productivity is calculated by the authors as value added in the relevant sector, in constant US\$ 2005 (source: World Development Indicators, 2014) divided by data for employment by industry published by the National Statistical Office of Thailand, third quarter.

¹⁵ Source: World Development Indicators.

¹⁶ In their study, LDCs are Argentina, China, India, Korea, Mexico, South Africa and Turkey and for these countries the period covered is 1970-2007.

¹⁷ The results of the ADF, EG and which are not presented due to space limitations, are available on request.

¹⁸ Three outcomes are possible due to the nature of the test. The series might be cointegrated, they might be all stationary or no conclusion can be drawn from the test.

¹⁹ Although normality is not a must for the residuals we report the probability values of the Doornik-Hansen test. Gelman and Hill (2007) underline that '[t]he regression assumption that is generally least important is that the errors are normally distributed. In fact, for the purpose of estimating the regression line (as compared to predicting individual data points), the assumption of normality is barely important at all.'

²⁰ Since we hypothesize a structural break starting from 1980s we applied the Chow test to that year. The same test is also conducted for the mid-sample date 1990, however, no signal of a break was detected.

²¹ We report the highest VIF of the regressors of a given regression. Values higher than 10 point at multicollinearity.

²² These estimations are comparable with those of Onaran and Galanis (2014) who get elasticities in the range of 0.316 for Turkey to 0.845 for South Korea with a labor share calculated like ALS₁.

²³ This variable takes the value 1 for the years 1997 and 1998, 0 otherwise. We also added the year 1998 since the impact of the crisis persisted.

²⁴ Since we do not have enough data for the import content of the exports of Thailand, we cannot address this issue in our current work.

²⁵ This variable takes the value 1 for the years 1973 and 1974, 0 otherwise. We included the year 1974 since the effect of the petrol crisis remained.

²⁶ e_{PULC} is 0.35 (Turkey)-0.77 (China) for the developing countries in the estimations of Onaran and Galanis (2014) ., while e_{PPM} is not significant for India, Mexico and China and for the others ranges between 0.12 (South Africa)-0.36 (Argentina).

²⁷ We excluded D1973-1974 from the estimations with ULC_2 since it was not significant.

²⁸ We also tried a third specification by including the dummy variable for the Asian crisis, but this variable was not significant. We opt for the second estimation for our calculations

²⁹ The classical Keynesian equation $\Delta \ln C = \text{constant} + e_{CY} \Delta \ln Y$ gives an income elasticity of 0.88. Although this coefficient cannot be directly used in our model, it gives an idea about the magnitude of the coefficient. Our estimates lie between 0.72 and 0.81.

³⁰ See the appendix on the derivation of multipliers.

³¹ Here it is implicitly assumed that domestic and imported goods are perfectly substitutable.

³² In constant 2005 dollars. Authors' calculations based on World Development Indicators, the World Bank.