Are Current Accounts Driven by Cost Competitiveness or Asset Prices? A synthetic model and an empirical test

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Alexander Guschanski
University of Greenwich

Engelbert Stockhammer
King's College London

Abstract

While current account imbalances have widened in recent decades, their causes are still debated. Trade-centred approaches highlight the role of cost competitiveness, in particular unit labour costs, and aggregate demand. In contrast, finance-centred approaches focus on gross financial flows, driven by expectations and the return on assets, that impact demand and the exchange rate. This paper, first, builds a simple model of the current account that provides a synthesis between the two approaches. Unit labour costs impact the current account via the real exchange rate and income distribution, while financial inflows drive up asset prices which leads to nominal appreciation and an increase in domestic demand. Second, we estimate a reduced form of this model for 28 OECD countries from 1972 to 2014, controlling for both trade- and finance-centred channels and a wide range of control variables. Our results indicate that finance-centred channels, via equity and residential property prices, drove current account divergence in the OECD, while unit labour costs were less important. They suggest that the effects of gross financial flows deserve more attention in theoretical and empirical models of the current account.

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Corresponding author: Alexander Guschanski, University of Greenwich, Park Row, Greenwich, London, SE10 9LS, UK, alexander.guschanski@gre.ac.uk

1. Introduction

Current account imbalances have been growing in recent decades, in particular since the mid-1990s. Although there has been some rebalancing since the Great Recession, overall substantial imbalances persist. This trend was accompanied by an increasing volume of gross financial flows, which in 2014 exceeded the volume of trade flows by a factor of four in advanced economies (Borio and Disyatat, 2015). Those flows, and their effect on asset prices, aggregate demand, and the current account, are increasingly discussed in the context of global financial cycles (Rey, 2015).

However, the determinants of the current account are still open to debate. We identify three broad literature streams. Trade-centred approaches highlight the impact of cost competitiveness, often proxied by unit labour costs, and aggregate demand. Labour cost increases lead to a real exchange rate appreciation which reduces net exports. Furthermore, wage increases contribute to a more egalitarian income distribution which has repercussions on domestic demand with ensuing changes in the current account. Finance-centred approaches focus on (gross) financial flows driven by the return on domestic assets and financial conditions abroad. A surge in financial inflows can lead to a nominal exchange rate appreciation which is translated into a real appreciation. Additionally, financial inflows impact asset prices and balance sheets and thus affect domestic demand, which then determines imports and thus the current account. These two approaches are situated within the Keynesian literature. A third, the savings-centred approach, is embraced by the mainstream literature and views current account imbalances as the consequence of saving decisions of optimising agents.

Against this backdrop the contribution of this article is twofold. First, it proposes a simple Keynesian model of the current account that synthesises trade-centred and finance-centred approaches. Second, it assesses the empirical explanatory power of the two approaches by

estimating a reduced-form current account equation for a panel of 28 OECD countries (1972-2014).

Our literature review shows that most of the theoretical (Keynesian) literature adopts the trade-centred approach. This applies to the Mundell-Fleming model, neo-Kaleckian distribution and growth models (Blecker, 1989, 1999; Onaran et al., 2011; Stockhammer and Wildauer, 2015), balance of payment constrained growth models (Thirlwall, 1979; Thirlwall and Hussain, 1982), as well as most stock-flow consistent (SFC) models (Belabed et al., 2018; Duwicquet and Mazier, 2010; Mazier and Tiou-Tagba Aliti, 2012). In contrast, the effect of financial flows features prominently in models of financial crises (Gallardo et al., 2006; Oreiro, 2006; Taylor, 1998). There is some empirical support for both approaches. More recent studies confirm the effect of asset prices on the current account (Chinn et al., 2014; Fratzscher et al., 2010; Fratzscher and Straub, 2009; Laibson and Mollerstrom, 2010), while evidence for the effect of unit labour costs is mixed (Behringer and van Treeck, 2018; Belke and Dreger, 2013; Diaz Sanchez and Varoudakis, 2013; Gabrisch and Staehr, 2014; IILS, 2011; Stockhammer and Sotiropoulos, 2014). Strikingly, none of the studies control for both unit labour costs and asset prices simultaneously. This implies that some of the results might suffer from an omitted variable bias and preclude a comparison of the relative size effects of finance- and trade-centred channels.

Our theoretical model goes beyond the existing literature by providing a synthesis framework where current account balances are the outcome of trade-related as well as of finance-related forces. Net exports respond to changes in nominal unit labour costs, the nominal exchange rate and aggregate demand. Demand is impacted by unit labour costs via income distribution and by asset prices via wealth and collateral effects. Asset prices respond to financial inflows which transmit global financial cycles to national economies and their current

account. Based on a reduced form of this model we estimate the current account with unit labour costs, the key variable capturing trade-centred channels, and asset prices, the key financial variable. We allow for various control variables, including some from the savings-centred approach, and present results for different estimators. Our findings indicate that asset prices, and in particular residential property prices, have played a major role in widening current account imbalances in the OECD. In contrast, we find no robust impact of nominal unit labour costs on the current account, suggesting that trade-centred channels were less relevant. This implies that financial flows, and their impact on demand and competitiveness, deserve more attention in debates on current account imbalances, which has important implications for future research and economic policy.

The next section presents a model that considers both trade-related and finance-related factors in determining output, the exchange rate and external balances. Section 3 discusses the existing literature, while Section 4 provides an econometric analysis of current account determinants, based on a reduced form of our model. Section 5 concludes and discusses implications for research and policy.

2. A synthesis model encompassing trade- and finance-centred channels

This section sketches a simple Keynesian open economy model that provides a synthesis of the trade- and finance-centred approaches.[1] The model illustrates the distinction between trade-related factors, such as labour costs, and finance-related factors, such as asset prices. The term trade-related factors refers to factors that have direct effects on exports and imports. Finance-related factors refer to those that directly affect gross financial flows. Subsequently, gross financial flows will impact domestic demand and the exchange rate and thus will have indirect

current account effects. Conversely, trade-related factors will affect the level of output, which may have second-round effects on gross financial flows. We analytically solve a simplified version of the model to provide a foundation for the empirical analysis in Section 4.

As section 3 will discuss in more detail, trade-centred approaches focus on the effect of labour costs and aggregate demand on net exports. Two main channels are highlighted: First, the *wage-real appreciation channel*: An increase in labour costs will partly be passed through to the real exchange rate, the main measure of international competitiveness. The ensuing appreciation of the real exchange rate will decrease net exports (e.g. Gandolfo, 2016, chap. 7). Second, the *distribution-demand channel*: Post-Keynesian models have highlighted the impact of income distribution on aggregate demand. An increase in labour costs will impact functional income distribution (the wage share) and subsequently domestic demand, with repercussion on the trade balance (Belabed et al., 2018; Blecker, 1989; Stockhammer and Wildauer, 2015). Hence, labour costs impact aggregate demand as well as competitiveness.

Importantly, in trade-centred models, financial flows do not have an independent effect on aggregate demand or the exchange rate. In contrast, the finance-centred approaches emphasise the impact of gross financial flows on the exchange rate, output and current accounts. Gross flows do not have a direct impact on the trade balance but affect it indirectly through two main channels. The *inflow-nominal appreciation channel*: An increase in financial inflows, e.g. due to increased demand for domestic assets, appreciates the nominal exchange rate and subsequently the real exchange rate (Gallardo et al., 2006; Kohler, 2019). This leads to losses in competitiveness and a reduction in the trade balance. Second, the *inflow-asset price channel*: Financial inflows, especially in the form of portfolio flows, tend to increase asset prices or, more broadly speaking, affect the balance sheets of domestic sectors.[2] This will increase consumption if people consume out of their wealth or may increase investment as

collateral values rise. The positive demand effect leads to a deterioration of the trade balance (Oreiro, 2006; Taylor, 1998).

In line with most theoretical contributions we focus on net exports rather than the current account, that are determined in a standard manner by income and the real exchange rate, here split into a domestic cost component and the nominal exchange rate:

$$NX = n_0 - n_1.Y - n_2.ULC - n_5.e\,, \qquad n_1, n_2, n_5 > 0 \tag{1}$$

where NX stands for net exports, and n_0 represents a net export shock. We assume that exchange rate expectations, foreign demand and the foreign price level are exogenous and thus will shift n_0. The usual assumption in theoretical models is that a real depreciation increases net exports, i.e. the Marshall-Lerner condition holds. As the real exchange rate is determined by the domestic price level and the nominal exchange rate, a real depreciation can be brought about either by a decrease in the domestic price level, captured by nominal unit labour costs (ULC), or a depreciation of the nominal exchange rate (e).[3] An increase in aggregate demand (Y), in turn, reduces net exports through an increase in the demand for imports. Thus the *wage-real appreciation channel* is captured through a negative impact of ULC on the current account in equation (1), due to a reduction in competitiveness.

Equation (2) states the open economy goods market equilibrium condition, while equation (3) defines domestic demand.

$$Y = Z + NX \tag{2}$$

$$Z = z_0 + z_1.Y + z_2.ULC + z_3.A - z_4.i\ , \qquad z_1, z_2, z_3, z_4 > 0 \tag{3}$$

Domestic demand (Z) is determined by a shift parameter (z_0), a multiplier effect ($z_1.Y$), the interest rate (i), ULC and asset prices (A). ULC account for the effect of income distribution on domestic demand, assuming that an increase in nominal ULC translates into an increase in real ULC, which are equivalent to the wage share (*distribution-demand channel*). For simplicity, we impose a positive impact of distribution on demand, thereby assuming that the economy is *domestically* 'wage-led' (Blecker, 1989). However, the open economy effect of a change in income might be negative due to adverse effects on net exports (see appendix A1). Demand depends positively on asset prices (A). We are using asset prices as a summary variable for balance sheet effects, i.e. the effects of an increase in wealth or collateral value. This captures the *inflow-asset price channel*. Substituting equation (1) and (3) into equation (2) we can solve for the open economy goods market equilibrium, which we denote by $Y^{ISNX} = Y^{ISNX}(ULC, A, f_0, i, e)$.

We model net (notional) financial inflows (F) as a function of income, asset prices, the interest rate and the nominal exchange rate [4]

$$F = f_0 + f_1.Y + f_3.A + f_4.i - f_5.e\ , \qquad f_1, f_3, f_4, f_5 > 0 \tag{4}$$

f_0 is a net inflow shock which could result from a monetary policy change in global financial centres. It therefore captures the effect of global financial cycles on domestic financial flows (Rey, 2015). Equation (4) allows us to incorporate different assumptions about the behaviour

of financial traders on the asset and foreign exchange markets. An increase in A, given Y and i, describes an asset price bubble which is not related to fundamentals such as changes in productivity (which would be reflected in Y). If international financial markets are dominated by momentum traders who expect further asset price increases, then higher asset prices will lead to net inflows (f_3>0). This is consistent with the behavioural finance literature (De Grauwe and Kaltwaser, 2012).[5] If fundamentalists dominate the market, one would expect mean reversion and thus (f_3<0). Similarly, a negative effect of e ($f_5 > 0$) corresponds to a foreign exchange market dominated by fundamentalist traders, for whom a reduction in e indicates a future appreciation, thereby inducing financial inflows (Stiglitz et al., 2006, p. 101). A positive sign for f_5 would imply that a reduction in e (keeping expectations constant) induces financial outflows, and would suggest a high proportion of momentum traders. Our assumption of a positive impact of the interest rate ($f_4 > 0$), which reflects the return of holding domestic currency, is standard.

Models with momentum traders typically give rise to interesting dynamics, in particular they will lead to bubbles and asset price cycles (e.g. Lavoie and Daigle, 2011, for cycles in the exchange rate). For the purpose of this paper we propose a simplified model as our main interest is on the current account. For the same reason we do not explore more complex temporal structures in the behavioural equations (see Kohler, 2019, for a model with cycles in growth, foreign debt and the exchange rate).

We assume that asset prices are positively affected by the relevant financial inflows and a shift parameter (a_0) which captures domestic factors:

$$A = a_0 + a_6.(f_0 + f_3.A)\,, \qquad a_0, a_6 > 0 \tag{5}$$

A full version of the model would include a portfolio allocation equation and allow for different financial assets. For simplicity we assume here that autonomous inflows (f_0) and those related to asset prices feed into asset price formation. Equation (5), in conjunction with equation (4), imposes a feedback effect between asset prices and financial inflows.[6] Abstracting from changes in foreign reserves, the balance of payments (BP) equilibrium requires that net financial outflows equal net exports ($NX = -F$). Using this equilibrium condition[7] to substitute equations (1), (4) and (5) we can solve for the exchange rate that is consistent with BP equilibrium $e^{BP} = e^{BP}(Y, ULC, A, f_0, i)$. This illustrates the *inflow-nominal appreciation channel*. An exogenous shock to financial inflows (via f_0) will increase asset prices (equation 5) and subsequently further increase financial inflows, thereby appreciating the nominal exchange rate e^{BP} (see also equation A.8 in the appendix).

We can now solve for equilibrium income (Y^*) and the equilibrium exchange rate (e^*) by substituting the exchange rate consistent with the BP (e^{BP}) and income consistent with the goods market equilibrium (Y^{ISNX}). e^* and Y^* define a short-run open economy equilibrium, which is fully consistent with the existence of asset price bubbles. An asset price bubble (rise in A) would lead to adjustment in e^* and Y^*, while the goods market and the BP continue to clear. Next, the equilibrium values (Y^* and e^*) can be substituted into equation (1) to obtain the equilibrium trade balance:

$$NX^* = n_0 - n_1.Y^*(ULC, a_0, i, f_0) - n_2.ULC - n_5.e^*(ULC, a_0, i, f_0) \quad (6.1)$$

$$NX^* = f(ULC, a_0, f_0, i) \quad (6.2)$$

Our main interest concerns the effects of a change in ULC and asset prices on the trade balance:

$$\frac{\partial NX^*}{\partial a_0} = -n_1 \frac{\partial Y^*}{\partial a_0} - n_5 \frac{\partial e^*}{\partial a_0} < 0 \tag{7.1}$$

$$\frac{\partial NX^*}{\partial ULC} = -n_1 \frac{\partial Y^*}{\partial ULC} - \ n_2 - n_5 \frac{\partial e^*}{\partial ULC} < 0 \tag{7.2}$$

The signs of equations (7.1) and (7.2) are derived in appendix A1 (equations A.11.1 and A.11.3). They imply that a positive asset price shock and an increase in ULC lead to a deterioration of the equilibrium trade balance. Similarly, a financial inflow shock (f_0) and a subsequent increase in asset prices would also reduce NX (equation A.11.2 in appendix A1). Our model thus accounts for all four finance- and trade-centred channels: under plausible parameter restrictions demand increases due to an increase in asset prices (via balance sheet effects) or ULC (via a change in income distribution). The real exchange rate responds to financial inflows and a rise in ULC.[8] Our model also includes a feedback effect between financial flows and asset prices and allows for exogenous shocks to either of those variables, for example as a consequence of global financial cycles.

While this model may appear similar to the Mundell-Fleming model (MFM), in fact, there are several important differences. The MFM excludes asset prices and, even more importantly, it neglects speculative behaviour and in particular speculative financial flows. Thus, while there is an independent equation for financial flows, they are solely governed by interest rate differentials. For example, a domestic demand shock will increase imports and the interest rate and the exchange rate adjust to ensure BP equilibrium. In contrast, our model, first, allows for

speculative financial behaviour as an increase in asset prices will induce financial inflows which further increase asset prices. Second, the increase in asset prices (and subsequent balance sheet effects) are an important determinant of aggregate demand. Hence, the inclusion of asset prices in our model is key for the transmission of financial flow effects on the real economy. Moreover, our model encompasses the MFM as a special case: our equilibrium net export function (equation 6.1) is consistent with the MFM, if parameters f_1, f_3, f_5, z_2, and z_3 are set to zero, in other words if there is no speculative behaviour on financial markets, no impact of the exchange rate on financial flows and no effect of asset prices on domestic demand.[9]

3. Trade-, finance- and savings-centred views of the current account

This section situates our model within the existing Keynesian open economy literature.[10] To be clear, much of this literature is concerned with explaining aggregate demand or effectiveness of different policy instruments, but we are interested in determinants of the current account. We group the literature into either finance- or trade-centred approaches. We also briefly discuss the (mainstream) saving-centred approach, which informs many empirical studies. Like us, the majority of theoretical contributions focus on the trade balance, thereby ignoring other parts of the current account such as income receipts and payments from foreign assets.

3.1 Trade-centred approaches

3.1.1 The Mundell-Fleming Model

In the Mundell-Fleming model net exports are determined by foreign and domestic income and the real exchange rate, while financial flows are driven by interest rate differentials, while asset prices are neglected. In contrast, our model accounts for the effect of asset-price driven

financial inflows on the exchange rate and aggregate demand. The feedback effect between asset prices and financial flows is another feature that allows for a more realistic modelling of financial dynamics and goes beyond the MFM. Within the MFM, one can perceive of a positive effect of financial inflows on aggregate demand if inflows increase the money supply, thereby leading to a reduction in the interest rate. Nevertheless, this is not an adequate mechanism in a more realistic setting with endogenous money supply and interest rates governed by central bank policy. In our model the money supply is endogenous, while the interest rate is exogenous. Hence, the MFM does not account for any of the finance-centred channels discussed above. Distributional effects on aggregate demand are not included either, while the effect of inflation on the real exchange rate is implicitly considered, even though wage setting is not usually modelled.

3.1.2 Neo-Kaleckian distribution and growth models

The neo-Kaleckian literature focuses on the relation between economic growth and income distribution, assessing the effect of a change in functional income distribution on consumption, investment and net exports (Blecker, 1989, 1999). The impact of an increase in the wage share, or equivalently real unit labour costs, if induced by an increase in nominal unit labour costs, has an unambiguous negative effect on exports through loss of competitiveness. Additionally, if demand is wage led, an increase in the wage share increases domestic demand, consequently further reducing net exports. Some recent studies include the effect of asset prices on consumption (and thereby imports) through a wealth effect (Onaran et al., 2011). Stockhammer and Wildauer (2015) additionally consider a negative effect of real estate prices on competitiveness, although the exact channel is not discussed. However, asset price booms are

not linked to financial inflows. Hence, this literature focuses on the *wage-real appreciation* and the *distribution-demand channel*.

3.1.3 Balance of payments constrained growth models

Another strand of literature based on Thirlwall (1979) focuses on the balance of payments-constrained growth rate, i.e. the growth rate that is consistent with a balanced trade position. Exports and imports are functions of domestic and foreign income and the real exchange rate. However, if net financial inflows are positive, the country can sustain negative net exports without being bound by the balanced growth rate (Thirlwall and Hussain, 1982). Yet, financial flows are captured by an exogenous parameter, and no further effect of financial flows on domestic demand or the exchange rate is considered. Hence, while this literature integrates the *wage-real appreciation channel*, it does not consider any of the other channels.

3.1.4 Stock-Flow Consistent (SFC) models

There is a growing literature of open-economy SFC models in the tradition of Godley and Lavoie (2007, chap. 12). SFC models typically include capital income in the consumption function, thereby allowing for a wealth effect (Belabed et al., 2018; Duwicquet and Mazier, 2010). However, the return on government bonds is exogenous, while the return on equities, when included, is usually independent of financial inflows, so that *the inflow-asset price channel* is not captured. In Belabed et al. (2018) and Duwicquet and Mazier (2010) equity prices are exogenous. The latter study also includes dividend payments which determine the demand for equities, but these are driven by profits which are determined on the goods market. The same holds for the *inflow-nominal appreciation channel* as there is no effect of financial

inflows on asset prices and successively on the exchange rate. The exchange rate is exogenous in Belabed et al. (2018) and Duwicquet and Mazier (2010). In Mazier and Tiou-Tagba Aliti (2012) the exchange rate is endogenously determined by the trade balance and the interest rate thus neglecting speculative financial flows. An exception is Lavoie and Daigle (2011), whose model includes a positive feedback effect between financial inflows and the exchange rate, if the proportion of momentum traders on the foreign exchange market is sufficiently high. Most SFC models account for the *wage-real appreciation channel* (Mazier and Tiou-Tagba Aliti, 2012). Even if price competitiveness isn't explicitly modelled, a 'shock to competitiveness' is often analysed as a shock to the import propensity (Duwicquet and Mazier, 2010; Lavoie and Daigle, 2011). Belabed et al. (2018) additionally include consumption effects of changes in income distribution, in line with the *distribution-demand channel*. Thus, with the exception of Lavoie and Daigle (2011), this literature is mainly trade-centred.

3.2 The finance-centred approach

Literature which has prominently focused on financial flows often describes the causes and consequences of financial crises. In contrast to mainstream approaches that rely on exogenous factors such as excessive fiscal expansion or foreign interest rate hikes, post-Keynesian scholars tend to model crises as the endogenous outcome from the normal functioning of capitalism, in line with Minsky's (1978) Financial Instability Hypothesis.

Several contributions incorporate the effect of financial flows on aggregate demand (*inflow-asset price channel*). Rather than a wealth effect, financial inflows impact aggregate demand through credit expansion or balance sheet effects in most studies. This is probably due to the focus on emerging market economies (EMEs), where wealth levels are generally lower than in advanced economies. While these are distinct channels, they all link financial flows to

domestic demand. Minskyan models which do incorporate a wealth effect are cast in a closed economy setting (e.g. Ryoo, 2010, 2013). Taylor (1998) discusses how financial inflows can trigger an expansion of credit denominated in foreign currency, thereby exposing firms to exchange rate risk. This leads to an investment boom and a current account deficit. The deterioration of the current account can induce a capital flow reversal and subsequent financial crisis. In Oreiro (2006) net exports are a function of the real exchange rate and aggregate demand, while financial flows are determined by interest rate differentials and exchange rate expectations. An exchange rate shock, e.g. due to liberalisation of the financial account, can induce a bubble in equity prices, based on portfolio reallocation of traders from foreign to domestic assets. This stimulates aggregate demand and appreciates the exchange rate, thereby reducing the current account and depleting the country of foreign reserves until it is faced with a currency crisis.

Gallardo *et al*. (2006) and Kohler (2019) additionally incorporate the *inflow-nominal appreciation channel*. In Gallardo *et al*. (2006) net exports are driven by income and the real exchange rate, while financial flows are driven by asset prices and the interest rate. An appreciation and an increase in asset prices triggers financial inflows, while net financial inflows can also increase the real exchange rate and asset prices. Thus, similar to Lavoie and Daigle (2011), there is a positive feedback effect between financial inflows and the exchange rate. Furthermore, financial inflows lead to domestic credit expansion, thereby contributing to output growth and a further decline in net exports. Kohler (2019) presents a Minskyan open-economy model where firms borrow in foreign currency. An exchange rate appreciation stimulates investment through balance sheet effects, which attracts pro-cyclical capital flows leading to a further appreciation. This is accompanied by a current account deficit which exerts downward pressure on the exchange rate, leading to contractionary balance sheet effects and a

recession. The model can give rise to endogenous cycles. To summarise, the Minskyan literature focuses on the finance-centred channels. Even though the inclusion of the real exchange rate implicitly allows for an impact of labour costs on competitiveness, with the exception of Oreiro (2006) labour cost effects are not explicitly modelled.

3.3 The savings-centred approach

In the mainstream literature the trade balance is determined by imbalances between savings and investment which are the outcome of inter-temporal optimisation decisions of rational agents (Obstfeld and Rogoff 1995) – hence we label this approach savings-centred. As agents' preferences are assumed to be stable, the focus is usually on the long-run. This literature has generated four main hypotheses to explain external imbalances. First, the twin deficit hypothesis postulates that an increase in the government deficit triggers an external deficit. Second, the life-cycle hypothesis predicts that an increase in the share of the out-of-working-age population will lower net savings and hence the trade balance. Third, trade imbalances can be seen as consumption smoothing during a catching-up process between countries in line with the Solow growth model. Fourth, the saving-glut hypothesis suggests that the Asian Crisis induced EMEs to accumulate foreign assets from advanced countries with high quality (financial) institutions, which financed the trade deficits of advanced economies.

Saving-centred studies do not usually consider the impact of income distribution or financial flows. An exception is Kumhof et al. (2012) whose DSGE model includes a negative effect of income inequality on the trade balance, mainly due to increased investment and consumption of top income households. In the two-country DSGE model by Fratzscher and Straub (2010) news shocks can impact equity prices with subsequent changes in the trade balance. However, news shocks are anticipated technology shocks and not liked to financial

flows. The disregard of finance-centred channels in savings-centred models might be due to the focus on macroeconomic savings (Borio and Disyatat, 2015). While macroeconomic savings are equal to the current account by definition, it is gross financial flows (not savings) that impact the exchange rate and aggregate demand and subsequently the current account.[11]

3.4 Empirical evidence for trade- and finance-centred channels

In contrast to the theoretical contributions, most empirical studies focus on the current account rather than the trade balance. However, econometric analyses typically control for net foreign assets, which account for most items of the current account that are not related to the trade balance. Additionally, variables derived from the savings-centred approach are included in most studies but are not discussed in detail below. This comprises the government budget, the old-age dependency ratio, GDP relative to the USA (or another benchmark) and the quality of (financial) institutions. Table 1 summarises representative empirical studies.

<Table 1>

3.4.1 Empirical evidence for trade-centred channels

The International Institute for Labour Studies (IILS, 2011) obtains a negative impact of the wage share on the current account, using a sample of 59 advanced and emerging economies between 1980-2008. As output is controlled for in their analyses the effect is likely due to a reduction in competitiveness in line with the *wage-real appreciation channel*. This is also confirmed by Behringer and van Treeck (2018) in a sample of 20 advanced countries (1972-2007).[12] Studies aiming to explain imbalances in the Eurozone often compare the effect of cost

competitiveness and divergences in domestic demand, stimulated by differentiated effects of the common monetary policy on North and South Europe. Jaumotte and Sodsriwiboon (2010) find a negative effect of the minimum wage to mean wage ratio on the current account in the Southern Euro Area for 1973-2008. This is also confirmed by Ivanova (2012) for a larger sample of 106 advanced and emerging economies between 1975-2009. Belke and Dreger (2013) find a negative impact of the real exchange rate (driven by wage divergence in the currency union) on current account balances, which is particularly relevant for deficit countries. Stockhammer and Sotiropoulos (2014) control for ULC and GDP and obtain a negative ULC elasticity of the current account between 0.1 and 0.25 in the Euro area between 1990-2011. While previously discussed articles use a single equation approach, Diaz Sanchez and Varoudakis (2013) and Gabrisch and Staehr (2014) estimate the current account as part of a vector autoregressive (VAR) model. Conversely, the effect of nominal unit labour costs on current account positions in the Eurozone is negligible according to their findings.

Support for the *distribution-demand channel* is presented by several studies in the neo-Kaleckian tradition such as Onaran et al. (2011) for the US and Stockhammer and Wildauer (2015) for 18 OECD countries. The two articles additionally introduce the effect of asset prices into neo-Kaleckian models. The former study finds a positive impact of housing wealth and financial wealth on consumption, although they do not estimate the direct effect of wealth on net exports. Stockhammer and Wildauer (2015) obtain positive effects of property prices on consumption, investment and net imports.

3.4.2 Empirical evidence for finance-centred channels

Recent contributions find a positive effect of gross financial inflows on asset prices and in particular property prices (e.g. Badarinza and Ramadorai, 2018, for London house prices).

Several studies include asset prices in current account regressions. Gruber and Kamin (2009) conduct a panel analysis for 84 advanced and emerging economies between 1982-2006. They find a statistically significant negative effect of the growth in stock market capitalisation on the current account while bond market capitalisation has a positive impact.[13] Chinn *et al*. (2014), for a sample of 109 advanced and developing economies, find that current account imbalances prior to the Great Recession are driven by returns on financial investment measured by property price and stock price indices. Fratzscher and Straub (2009) estimate a Bayesian VAR and obtain a negative impact of asset prices on the current account, which operates through an increase in investment and consumption, as well as an appreciation of the real effective exchange rate. Fratzscher *et al.* (2010) find that shocks to house and equity prices are the main drivers of the US trade balance. Laibson and Mollerstrom (2010) show that increased consumption due to asset price hikes explains the US current account deficit better than the saving-glut hypothesis. They find a strong correlation between real estate prices and current account balances although other variables are not controlled for. Unger (2017) obtains a negative impact of the ULC-deflated real exchange rate and domestic credit provision (capturing domestic demand) on the current account in the Euro Area. He highlights the differentiated effects of the common monetary policy as the main driver of domestic demand, although property prices are considered in a robustness test. Notably, the coefficient for domestic credit provision is smallest when house prices are included (Unger, 2017, p. 442), indicating asset prices as potential drivers of the increase in credit demand.

Summing up, the dichotomy of a trade- and finance-centred focus which characterises theoretical contributions is also reflected in empirical analyses: none of the econometric studies control for ULC as well as asset prices simultaneously. Most studies obtain an effect of either

ULC or asset prices on the current account. Unless GDP and the real exchange rate are controlled for, omitting labour costs or asset prices excludes potentially important determinants. Of the 14 reviewed studies, six do not control for the exchange rate, thereby omitting the *wage-real appreciation channel* (Chinn et al., 2014; Gruber and Kamin, 2009) or the *inflow-nominal appreciation channel* (Behringer and van Treeck, 2018; IILS, 2011; Ivanova, 2012; Jaumotte and Sodsriwiboon, 2010). Belke and Dreger (2013) and Unger (2017) only indirectly control for changes in domestic demand via GDP relative to the Euro Area average, which is supposed to capture a catching-up effect. Hence they do not fully account for the *distribution-demand channel* (Unger, 2017) and the *inflow-asset price channel* (Belke and Dreger, 2013). If the excluded variable is correlated with the covariates, these studies suffer from an omitted variable bias. Gabrisch and Staehr (2014) and Laibson and Mollerstrom (2010) only focus on two variables, thereby omitting a variety of channels. Stockhammer and Sotiropoulos (2014), Fratzscher and Straub (2009), Fratzscher *et al*. (2010) and Diaz Sanchez and Varoudakis (2013) control for the real exchange rate as well as GDP, thereby (indirectly) capturing all trade- and finance-centred channels. Yet, none of the studies allows an assessment of the relative size effect of trade- and finance-centred channels, as this requires including ULC and asset prices simultaneously.

4. Empirical analysis: what drives current account imbalances?

In line with previous empirical studies we focus on the current account rather than net exports for our econometric analysis. The two largest items of the current account (CA) are the trade

balance and factor income. Factor income is closely linked to the (lagged) net foreign asset position (NFA) and thus can be considered a function thereof.

$$CA_{j,t} = NX_{j,t} + f(NFA_{j,t-1}) \tag{8}$$

j stands for country and t for year. Based on equation (6.2) we use nominal ULC and asset prices to capture trade and finance-centred channels. Our baseline model takes the following form:

$$CA_{j,t} = \beta_{PP}(\widetilde{PP}_{j,t}) + \beta_{SP}(\widetilde{SP}_{j,t-1}) + \beta_i.(\tilde{\imath}_{j,t}) + \beta_{ULC}.(\widetilde{ULC}_{j,t}) + \beta_{NFA}.(NFA_{j,t-1}) + \varepsilon_{j,t} \tag{9}$$

PP and SP stand for property and share price indices, and ULC are nominal unit labour costs, all expected to have a negative impact on the current account. i is the short-term nominal interest rate. Depending on whether the positive effect on financial inflows outweighs the contractionary effect on domestic demand, we expect a negative or a positive sign. The exchange rate and total income are not included in the specification as they constitute adjusting variables according to our model. In robustness tests we also consider variables emphasised by the savings-centred approach such as relative GDP per capita (p.c.), the dependency ratio, the government balance and credit to the private sector. The composite error term $\varepsilon_{j,t}$ consists of country and time specific components, in addition to a random disturbance term. The current account is estimated for an unbalanced panel of 28 OECD countries[14] for a maximum time period of 1972-2014. Data sources and descriptive statistics are reported in Table A.1 and A.2

in the Appendix, while Table A.3 reports pairwise correlations. Variables were taken in logarithms with the exception of the current account, net foreign assets, and the government balance. Also, following standard procedure in the literature PP, SP, i, ULC and the dependency ratio are transformed into their GDP weighted deviations from the sample mean (Behringer and van Treeck, 2018; Chinn et al., 2014; Fratzscher and Straub, 2009).[15] More formally, the following adjustment was applied:

$$\tilde{X}_{j,t} = \ln\left(X_{j,t}\right) - \ln\left[\frac{\sum_{j=1}^{n}(X_{j,t} \times GDP_{j,t})}{\sum_{j=1}^{n} GDP_{j,t}}\right] \tag{10}$$

The rationale is that an asset price rise in the home country will only have adverse effects on the current account if prices increase relative to those of trading partners.

We test for stationarity of our data by applying the Fisher unit root tests with trend (Choi, 2001; see Table A.4), which suggests that most of our variables are integrated of order 1. As reported below we fail to find evidence for cointegration. We therefore use the first-difference estimator as the baseline specification but will report other estimators for robustness. Standard errors are robust with respect to serial correlation within countries, as well as heteroscedasticity (Newey and West, 1987). In order to determine the lag-structure of our baseline specification (equation 9) we start from an Auto-regressive Distributed Lag (ARDL) model in first differences with a lagged dependent variable and a contemporaneous and lagged explanatory variable each and successively exclude statistically insignificant lags of explanatory variables based on the lowest T-statistic until only one measure per variable is left.[16] Furthermore, we include period effects in our estimations if they are jointly statistically significant.

Results for the baseline specification are reported in specification 1 of Table 2. Both property prices and share prices are statistically significant at the 1%-level with negative coefficients. The coefficients imply that a growth rate of property prices by 1%-point above the weighted average growth rate reduces the rate of change of the current account to GDP ratio by 0.1%-points. For example, if property prices in Spain grew by 10% between two years, while the average growth rate in the sample was 0%, we would expect that the current account to GDP ratio in Spain declined by 1%-point in the same period, *ceteris paribus*. The effect of share prices is smaller and would imply a reduction of the current account by 0.15%-points. Interestingly, nominal ULC are not statistically significant. This casts doubt on the relevance of the trade-centred channels. NFA have a positive impact, albeit statistically significant at the 10%-level only. The interest rate also has a positive sign indicating that the contractionary effect on GDP outweighs the positive effect on financial inflows.

<Table 2>

We make our baseline subject to a variety of robustness tests. Specification (2) applies the mean-group estimator proposed by Pesaran and Smith (1995) using first-differenced series. It estimates time-series equations for each country separately and averages the coefficients. Furthermore, we include a constant in each estimation, thereby controlling for country-specific trends.[17] Property and share prices are significant at the 5%-level and exhibit a higher coefficient in comparison to the baseline specification. The similar results between our baseline and the mean-group estimator confirm the validity of the pooling assumption. However, the interest rate and NFA turn insignificant, pointing toward a potential overstatement of these effects in our baseline. ULC remains statistically insignificant.

Contributions based on the finance-centred approach have highlighted the potential endogeneity of assets prices. For example, a high current account deficit can trigger capital flight and a decline in asset prices (e.g. Taylor, 1998). Given the lack of external instruments our main alternative is to use lagged values of the variables. Hence, we employ the widely used difference-General Method of Moments (GMM) estimator (Arellano and Bond, 1991) in specification (3). Equivalent to our baseline specification, this estimator relies on a first-difference transformation of our variables. Additionally we instrument property prices and stock prices with their lagged level values, thereby treating them as predetermined rather than exogenous. This allows for PP to be a function of the previous period's current account position. The Hansen test, as well as tests for autocorrelation in the residuals, fail to reject the null-hypothesis of validity of our instruments. Furthermore, the failure to reject autocorrelation of first order in the residuals suggests that residuals in our baseline are stationary. The coefficient for property prices is statistically significant with the expected sign, suggesting that potential bias due to endogeneity is negligible. However, share prices become insignificant, casting doubt on the robustness of their effect.

Given that several variables are I(1) we test for cointegration relationships which would suggest the use of autoregressive distributed lag models (ARDL).[18] We apply the cointegration tests developed by Pedroni (1999). Results are somewhat sensitive to the test statistic used, but three of four tests fail to reject the null of no cointegration as reported in Table A.5. This suggests that our variables are not cointegrated. Nevertheless, for robustness we report an ARDL in specification (4) to account for a potential relationship in levels that is not captured in our baseline specification. We use the system-GMM estimator (Blundell and Bond, 1998) to account for the dynamic panel bias.[19] Results, reported in specification (4), suggests that we pass all relevant tests for instrument validity. The coefficient of the lagged dependent variable

is close to unity, while coefficients for contemporaneous and lagged asset prices are statistically significant and very similar in absolute value with opposing signs. This confirms our choice of the first-difference estimator for our baseline specification. Nominal unit labour costs remain statistically insignificant, while other control variables perform as expected.

Specification (5) estimates our baseline for the years after 1995, thereby focusing on a period that is characterised by an acceleration of current account divergence. Additionally, by reducing the time dimension we obtain a more balanced panel, which ensures that our results are not driven by individual countries with relatively long time series. Comparison of specifications (1) and (5) shows increased coefficients of all main explanatory variables, while the signs remain the same. In particular, the coefficient for property prices increases from 10.2 to 13. The coefficient for share prices increases from 1.5 to 2, while ULC remain statistically insignificant. This suggests an increasing relevance of the finance-centred channels in recent years.

<Table 3>

We include additional control variables in our last set of robustness tests, reported in Table 3. The Eurozone constitutes a special sub-sample for three reasons. First, the effect of financial inflows on the nominal exchange rate (*inflow-nominal appreciation channel*) is blocked in a currency union. Thus, the effect of asset prices on the current account might be weaker for Euro members. Second, the unit labour costs elasticity of the current account might be higher in the Eurozone because the exchange rate is fixed and due to stronger competition between countries. Third, there is an argument that current account imbalances in the Eurozone were driven by differentiated impacts of the common monetary policy (Unger, 2017). We

capture this by an interaction of asset prices, unit labour costs, and the interest rate with a dummy variable that takes the value of one beginning with the year in which the country entered the Eurozone (suffix *EZ* in specification 6). As the interest rate is supposed to have different effects on South and North Europe, it is only interacted with South European countries (Greece, Italy, Portugal, Spain). The results indicate that there is no statistically different effect of asset prices on Euro members, suggesting that the impact of asset prices on the current account works mainly via changes in aggregate demand, in line with the *inflow-asset price channel*. In contrast, the effect of ULC is negative for Eurozone members while it is insignificant for non-members. A Wald test on the sum of the coefficients for ULC indicates that the overall effect is also negative. This suggests that ULC have an impact on the current account in the Eurozone, even though the effect is relatively small (less than half) in comparison to asset prices. Similarly, the effect of the interest rate is negative for South European countries and the Wald test indicates that the sum of the coefficients is not statistically different from zero. This suggest that the positive impact of the interest rate on the current account (via a reduction in aggregate demand) was not effective for Southern Europe. It is consistent with the hypothesis of a differentiated impact of the common monetary policy but does not imply that the effect was expansionary.

Specification (7) includes real instead of nominal unit labour costs. Interestingly, while asset prices stay significant, real ULC are significant as well. Nominal and real unit labour costs need not move together. In our sample (Table A.3) the correlation coefficient is 0.49. Hence, the significance of real ULC cannot be considered evidence for the *wage-real appreciation channel*. However, real ULC are equivalent to the wage share with GDP taken at market prices (rather than factor prices). Thus this variable might capture the *distribution-*

demand channel more precisely than nominal ULC. Indeed, estimations with the wage share instead of real ULC show very similar results.

Specifications (8-13) control for additional variables, including those emphasised by the savings-centred approach. These are foreign GDP, which is calculated as the sum of the GDP of all countries included in the sample excluding the respective country and controls for foreign demand; GDP p.c. relative to the US accounting for the catching-up hypothesis[20]; the domestic credit to GDP ratio (CREDIT) as indicator for financial market development; the dependency ratio (the out-of-working-age population as a ratio to the working-age population) as emphasised by the lifetime-income hypothesis; and the government balance in line with the twin-deficit hypothesis. Specification (13) includes all explanatory variables simultaneously. These robustness tests strongly confirm our baseline results – property prices and share prices are statistically significant in every specification. Of the control variables, *CREDIT*, foreign GDP and the dependency ratio have a statistically significant impact on the current account. The other variables remain statistically insignificant. Notably, *CREDIT* also has an alternative interpretation. As discussed in Section 2, asset price rises can impact the current account via changes in the nominal exchange rate (*inflow-nominal appreciation channel*) and GDP (*inflow-asset price channel*). However, while the former mechanism presupposes financial inflows, the latter could also work via domestic credit creation without capital flowing into the country. The fact that property prices remain significant in specifications (12-13), albeit with a reduced coefficient, suggests that foreign as well as domestic finance are relevant, and provides evidence that asset prices are (at least partly) driven by financial inflows.

Lastly, we report standardised coefficients for our baseline specification (specification 1, Table 2) in equation (11). Standardised coefficients measure the effect of a one standard

deviation change of the explanatory variables on the current account, thereby allowing to compare the relative effect size of variables with different variances and units of measurement.

$$CA_{j,t} = -0.32 \ln(PP_{j,t}) - 0.11 \ln(SP_{j,t-1}) + 0.14 \ln(i_{j,t}) + 0.02 \ln(ULC_{j,t}) + 0.15 (NFA_{j,t-1}) + \varepsilon_{j,t} \quad (11)$$

Property prices exert the largest effect on the current account. An increase in the growth rate of property prices by one standard deviation reduces the rate of change of the current account by 0.32%-points. The other variables with a significant impact are share prices, the interest rate and NFA – a standard deviation increase in the growth rate of these variables changes the rate of change of the current account by about 0.13%-points. The effect of ULC is negligible in line with our estimation results.

5. Conclusion

This article sketches a Keynesian model of the current account that incorporates both trade- and finance-related factors. The Keynesian literature is split into trade-centred approaches which focus on the effect of labour costs and domestic demand and finance-centred approaches that emphasise the impact of gross financial flows on the nominal exchange rate and demand. This theoretical division is largely reflected in empirical studies which do not control for trade-centred and finance-centred channels jointly, thereby potentially omitting important variables. Our theoretical model builds a bridge between these literatures by allowing standard competitiveness effects and combining them with speculative financial flows that affect the exchange rate and domestic output via asset prices and balance sheet effects, with repercussion

for the current account. We estimate a reduced form of this model for 28 OECD countries between 1972 and 2014. We capture trade-centred channels with unit labour costs and finance-centred channels by property and stock prices, while controlling for a variety of variables. Our results suggest that property prices are the single most important explanatory variable for current account positions in the OECD, and this finding is robust to different estimation methods and model specifications. Share prices also have a sizeable impact, although they are less robust to the application of different estimators. The impact of asset prices is particularly strong for the period 1995-2014, which has witnessed an acceleration in the divergence of current account positions. This is in line with the findings of Chinn, *et al.* (2014). The effect of nominal ULC on the current account is not statistically significant in most estimations, although there is some evidence for a negative, albeit small, impact for Eurozone members. These results suggest that finance-centred channels are more relevant than trade-centred channels in determining current account positions in the OECD.

Our findings have important implications for future research and for economic policy. Much of the existing post-Keynesian literature, including the Neo-Kaleckian, the balance of payments constrained growth and most of the SFC models, pay insufficient attention to finance-centred channels (Belabed et al., 2018; Onaran et al., 2011; Thirlwall and Hussain, 1982). Some models analysing financial crises in the Minskyan tradition in an open economy setting have a key role for capital flows, but most of this literature has focused on emerging economies (Gallardo et al., 2006; Oreiro, 2006). Our empirical findings suggest that these models also have relevance for advanced economies. Theoretical as well as empirical models of the current should consider both trade- and particularly finance-centred channels.

Most policy recommendations for rebalancing current accounts focus on measures of cost competitiveness, mainly through reducing unit labour costs in deficit countries (Belke and

Dreger, 2013) or increasing unit labour costs in surplus countries (Flassbeck and Lapavitsas, 2013; Hein, 2013). This continues to be a major focus of the Macroeconomic Imbalance procedure of the European Commission. However, our findings show that policy interventions focusing on unit labour costs will be futile, unless there is regulation of financial flows and asset markets. This could be done via capital controls, especially on portfolio flows, particularly during boom phases. Macroprudential regulation, for example by expanding the Basel III countercyclical capital cushion, is another option to reduce excessive credit growth and limit the risk of asset price bubbles (Rey, 2015). While these policies are increasingly on the agenda to reduce financial fragility, they have not yet been highlighted as a tool to regulate current account imbalances.

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Endnotes

[1] We only report the main equations in the text. Remaining derivations can be found in the appendix. Factors emphasised by the savings-centred approach are omitted for two reasons. First, the savings-centred approach focuses on long-run factors, while our time-horizon is the short- to medium-run. Second, the neoclassical framework based on optimising agents is fundamentally different from the Keynesian approaches.

[2] Note that balance sheet effects as used here encompass wealth effects, changes in the value of the collateral or changes in the real-debt burden if it is denominated in foreign currency.

[3] e stands for the inverse of the nominal exchange rate, so that an increase in e denotes an appreciation of the domestic currency.

[4] There is a difference between the financial account as reported in national statistics and the equation considered in the model. Most financial transactions, e.g. purchases of financial assets by non-residents, would not lead to a change in the *net* financial account as reported by national statistics. However, what matters for many macroeconomic questions are *gross* financial flows. Therefore, F denotes 'notional' financial flows, which consist of net financial flows that will mirror trade flows as well as those gross financial flows that will have an impact on the exchange rate or domestic demand. This simplification is often adopted in theoretical models (Gallardo et al., 2006; Kohler, 2019) and allows to integrate the finance-centred channels without having to model net and gross financial flows separately.

[5] While De Grauwe and Kaltwaser (2012) focus on the foreign exchange market we apply this concept to the asset market.

[6] The model results are robust to omitting this feedback effect.

[7] More precisely, we assume that adjustment of the exchange rate establishes the equilibrium between notional financial flows (F) and trade flows (NX). Some economists have argued that changes in reserves should be the accommodating variable (Taylor, 2004, pp. 307–38), while others favour the exchange rate (Bhaduri, 2003; Gandolfo, 2016, pp. 133–54). We follow the latter line of literature.

[8] See also equations (A.10.1)–(A.10.4) in the appendix.

[9] An additional difference is that our model allows for the impact of income distribution on domestic demand, whereas the MFM does not.

[10] While the MFM is a Keynesian model, the other Keynesian literature streams discussed in the review belong to the post-Keynesian tradition.

[11] This is particularly relevant for the saving-glut hypothesis (Borio and Disyatat, 2015). Fist, a current account surplus in emerging economies and a current account deficit in the US does not imply that the former finances the latter, as there could be a third group of countries that accumulates a surplus towards the US and a deficit towards emerging economies. Second, market interest rates are not determined by global savings but by monetary policy and expectations about future economic conditions. Hence, it is unlikely that excess savings in emerging economies drove down world interest rates.

[12] Conversely, personal inequality (measured by the Gini-coefficient or increasing top income shares) leads to current account deficits via an increase in credit demand and consumption, in line with the model by Kumhof et al. (2012).

[13] However, these variables are interpreted as a measure of financial development in line with the saving-glut hypothesis rather than a control variable for the finance-centred channels.

[14] Austria, Belgium, Canada, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Latvia, Luxembourg, Netherlands, Norway, Poland,

Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, United Kingdom and the United States. While this is a diverse set of countries, our results are very robust to estimations with a reduced sample of OECD economies with longer data series, i.e. excluding the Czech Republic, Estonia, Hungary, Iceland, Luxembourg, Latvia, Poland, Slovak Republic, and Slovenia. We had to exclude some countries that would be interesting for the assessment of current account imbalances such as China due to data availability. However, most OECD countries list other OECD countries as their main trading partners.

[15] We do not transform NFA, foreign GDP and relative GDP as these variables are measured relative to the other countries by definition and therefore do not require transformation. Similarly, we do not transform the government budget or the domestic credit ratio since it is the country specific measure that matters for the current account, not its level in comparison to other countries.

[16] This is the reason why SP enters with a lag in our baseline equation. NFA enters always with one lag as it is not derived from a behavioural equation but captures factor income.

[17] Three countries (Czech Republic, Latvia and Poland) are excluded from the mean-group estimation as they have too few observations.

[18] ARDLs are mathematically equivalent to error-correction models (ECM) but preferred in the case of a mix of I(0) and I(1) variables.

[19] The bias in dynamic fixed-effect panel estimations (Nickell-bias) arises due to the correlation between the error term and the lagged dependent variable. The GMM estimator eliminates the bias by instrumenting the lagged dependent variable by its lags.

[20] Given that this variable might simply capture the effect of domestic demand growth, which will lead to a decline in the current account, we include it with a lag.

Tables

Table 1: Empirical literature on the current account

Author	**Sample**	**Estimation Method**	**Covariates**
Behringer & Van Treeck 2018	1972-2007 20 AE & EME	OLS, FE, 4-year, 2SLS	**WS(-),** INEQ(-), NFA(+), growth(-), POPG(-), SC, FINS
Belke & Dreger 2013	1982-2008 11 Eurozone countries	ECM	**REER(-),** i_r(+), SC
Diaz Sanchez & Varoudakis 2013	1975-2011 13 Eurozone countries	VAR	CA, **REER**, i_r, RELGDP, growth
Gabrisch & Staehr 2014	1995-2012 27 EU countries	VAR	CA, **NULC**
IILS 2011	1980-2008 59 AE & EME	GLS, FE	**WS(-),** GDP(0), NFA(+), CBRES(+), INEQ(-), SC, FINS
Ivanova 2012	1975-2009 106 AE & EME	OLS, RE	**MW(-)**, growth(0), OPEN(0), OIL(+), tax(+), FINS, LMI, SC
Jaumotte & Sodsriwiboon 2010	1973-2008 49 AE & EME	4-year	**MW(-),** growth(0), OIL(+), FINS, LMI, SC
Stockhammer & Sotiropoulos 2014	1990-2011 12 Eurozone countries	FD	**NULC(-),** GDP(-)

Table 1: Empirical literature on the current account, continued

Author	**Sample**	**Estimation Method**	**Covariates**
Chinn *et al.* 2013	1970-2008 109 AE & EME	5-year	**PP(-), SP(-), BP(-)**, LEGAL(+), growth(0), OPEN(0), OIL(+), i_r(-), FINS, SC
Gruber and Kamin 2009	1982-2006 84 AE & EME	FE, 5-year	Δ**SP**(-), **BP**(+), GDP(+), growth(0), OIL(+), OPEN(0), FINS, SC
Fratzscher & Straub 2009	1974-2007 G7	Bayesian VAR	CA, Δ**SP,** C, INFL, i_n, REER
Fratzscher *et al.* 2010	1974-2008 US	Bayesian VAR	CA, **SP, PP,** C, INFL, i_n, REER
Laibson & Mollerstrom 2011	1996-2007 (quarterly) 19 AE & EME	OLS	**PP(-)**
Unger 2017	1999-2013 11 Eurozone countries	ECM	**REER(-), PP(-),** BANKCLAIMS(0), POPG(-), NFA(-), i_r(+), SC

Notes: The dependent variable of all analyses is the current account. 2SLS=two-stage least squares; 4,5-year=estimations using 4 or 5-year averages of the data; AE=advanced economies; BP=bond prices; BANKCLAIMS=claims of domestic banks on debtors in other euro-area countries; C=consumption; CA=current account; CBRES=central bank reserves; ECM=Error correction model; EME=Emerging economies; FD=first-difference estimator; FE=within-estimator; FINS=financial institutions (e.g. financial openness index, etc.); GLS=Generalised least squares estimator; growth=GDP growth; i_r/i_n=nominal/real interest rate; INFL=inflation rate; INEQ=measures of personal income inequality (e.g. Gini coefficient); LEGAL=institutional quality; LMI=labour market indicators; MW=minimum wage; NFA=net foreign assets; NULC=nominal unit labour costs; OIL=oil price, oil trade balance or dummy for oil-producing countries; OPEN=exports plus imports/GDP; OLS=ordinary least-squares; PP=property price index; POPG= Population growth; RE=random-effects estimator; REER=real effective exchange rate; RELGDP=GDP relative to EU average; SC=variables emphasised by the saving-centred approach as described in the text; (Δ)SP=(change in) stock market capitalisation; tax=corporate income tax rate; VAR=Vector-auto-regressive model; WS=wage share.
(-), (+), (0) stands for statistically significant and negative, statistically significant and positive, and statistically insignificant, respectively.

Table 2: Baseline results and different estimation methods

	(1)	(2)	(3)	(4)	(5)
estimation method	*FD*	*MG*	*GMM*	*ARDL*	*FD*
PP_t	-10.224***	-20.625**	-3.913**	-7.905***	-13.021***
	(2.164)	(8.340)	(1.787)	(2.630)	(3.567)
PP_{t-1}				7.699***	
				(2.593)	
SP_{t-1}	-1.501***	-2.289**	-0.544	-1.700***	-2.022***
	(0.511)	(1.043)	(2.055)	(0.507)	(0.762)
SP_{t-2}				1.470**	
				(0.587)	
i_t	1.135*	-0.872	0.099	0.025	1.307**
	(0.587)	(0.750)	(0.645)	(0.370)	(0.628)
i_{t-1}				-0.047	
				(0.328)	
ULC_t	0.581	-5.277	-2.469	-1.353	0.865
	(1.325)	(4.567)	(1.887)	(1.334)	(2.319)
ULC_{t-1}				0.543	
				(1.273)	
NFA_{t-1}	2.953*	-6.848	3.256	3.878*	3.041*
	(1.749)	(5.061)	(3.212)	(2.114)	(1.688)
NFA_{t-2}				-3.657*	
				(1.924)	
CA_{t-1}				0.861***	
				(0.096)	
constant		0.471**		-0.002	
		(0.210)		(0.146)	
year dummies	Yes	No	No	No	Yes
countries	28	25	28	28	28
observations	634	626	634	634	372
F-test PE	0.000				0.164
Hansen-test			0.230	0.365	
AR1			0.609	0.001	
AR2			0.560	0.600	
period	1973-2014	1973-2014	1973-2014	1973-2014	1996-2014

Notes: The dependent variable is the current account (%GDP), standard errors in parenthesis. *, **, *** denote statistical significance at the 10%, 5%, and 1% level. FD is the first-difference estimator, FE the within-group estimator, MG is the mean-group estimator, GMM is the General Method of Moments estimator, ARDL stands for autoregressive distributed lag model. PP= property prices, SP=share prices, i=nominal interest rate, ULC=nominal unit labour costs, NFA=net foreign assets, CA=current account. F-test PE denotes the Wald test on the joint significance of all year dummies, Hansen-test denotes the p-value of the Hansen test of overidentifying restrictions, AR1 and AR2 are tests for autocorrelation in the residuals of first and second order.

Table 3: Robustness tests

	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
PP_t	-10.210***	-9.333***	-10.003***	-10.329***	-10.526***	-12.296***	-7.999***	-10.254***
	(2.254)	(2.111)	(2.173)	(2.530)	(2.185)	(3.228)	(1.718)	(2.953)
PP_t_EZ	0.498							
	(2.142)							
SP_{t-1}	-1.464***	-1.574***	-1.438***	-1.514***	-1.490***	-1.688**	-1.356***	-1.483**
	(0.530)	(0.471)	(0.515)	(0.513)	(0.517)	(0.658)	(0.486)	(0.636)
SP_{t-1}_EZ	-0.287							
	(0.996)							
i_t	1.226**	1.111*	1.205**	1.122**	1.128*	1.194**	0.564	0.622
	(0.595)	(0.574)	(0.593)	(0.566)	(0.582)	(0.608)	(0.413)	(0.451)
i_t_SEZ	-1.273							
	(1.002)							
ULC_t	0.961		0.628	0.533	0.573	0.092	0.975	0.413
	(1.369)		(1.326)	(1.259)	(1.310)	(1.767)	(1.447)	(1.743)
ULC_t_EZ	-4.031							
	(2.453)							
NFA_{t-1}	3.062*	3.142*	2.943*	2.961*	3.017*	2.588	3.183*	2.980*
	(1.727)	(1.762)	(1.750)	(1.744)	(1.720)	(1.614)	(1.782)	(1.589)
$RULC_t$		-17.680***						
		(5.995)						
FGDP			50.941**					60.315***
			(21.458)					(21.783)
RELGDP				0.911				3.687
				(5.638)				(6.894)
DEPR					-12.901**			-21.981**

					(6.329)			(9.673)
GB						0.102		0.105
						(0.077)		(0.072)
CREDIT							-2.265**	-2.773**
							(0.894)	(1.117)
Wald i-rate	0.962							
Wald ULC	0.175							
countries	28	28	28	28	28	28	28	28
observations	634	634	634	634	634	462	620	448
F-test PE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
period	1973-2014	1973-2014	1973-2014	1973-2014	1973-2014	1973-2014	1973-2014	1973-2014

Notes: The dependent variable is the current account (%GDP). Estimation method is the first-difference estimator. PP= property prices, SP=share prices, i=nominal interest rate, ULC=nominal unit labour costs, NFA=net foreign assets, RULC=nominal unit labour costs, RELGDP=GDP p.c. relative to sample mean, DEPR=dependency ratio, GB=government balance, CREDIT=domestic credit/GDP. EZ stands for interaction with Eurozone members and SEZ for interaction with Greece, Italy, Portugal, Spain. Standard errors in parenthesis. Wald i-rate and Wald ULC denote Wald test on the sum of the coefficient for the interest rate and ULC and their interacted value. F-test PE denotes the Wald test on the joint significance of all year dummies. *, **, *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Appendix

A1: Derivation of the theoretical model (Section 2)

This section solves our model for some (plausible) simplifying assumptions to motivate the empirical analysis. In particular, for lack of space, we leave to future research to fully integrate the analysis of unstable or cyclical dynamics, which some of the finance-centred literature has highlighted.

To derive the equation for the open economy goods market equilibrium we substitute equations (1) to (3) and set $m = a_6.f_3$:

$$Y^{ISNX} = \frac{1}{\delta^Y}.\left[z_0 + n_0 + (z_2 - n_2).ULC + \frac{z_3}{1-m}.a_0 + \frac{z_3 a_6}{1-m} f_0 - z_4.i - n_5.e \right] \quad \text{(A.1)}$$

Where the goods market multiplier is denoted by δ^Y.

$$\delta^Y = 1 - z_1 + n_1 > 0 \quad \text{(A.2)}$$

The function for financial inflows is derived by substituting equation (4) and (5):

$$F = \frac{1}{1-m}.(f_0 + f_3.a_0) + f_1.Y + f_4.i - f_5.e \quad \text{(A.3)}$$

Substituting equation (1) and (A.3) into the Balance of Payments (BP) identity ($NX = -F$) with changes in reserves set to zero we solve for the exchange rate that is consistent with the BP, e^{BP}:

$$e^{BP} = \frac{1}{\delta^F}.\left[n_0 - n_2.ULC + \frac{1}{1-m}f_0 + \frac{f_3}{1-m}.a_0 + f_4.i + \vartheta^M.Y\right] \quad (A.4)$$

$$\vartheta^M = f_1 - n_1 > 0 \quad (A.5)$$

$$\delta^F = n_5 + f_5 > 0 \quad (A.6)$$

Equation (A.5) assumes that financial inflows are more elastic with respect to a change in income (Y) than trade flows.[1] Nevertheless, the difference between f_1 and n_1, and hence ϑ^M, can be expected to be small, because the majority of speculative financial flows are more likely be driven by asset prices and the exchange rate rather than real GDP (Y). Equation (A.6) is assumed to be positive as $f_5 > 0$, which corresponds to a foreign exchange market dominated by fundamentalist traders.

We can now solve for equilibrium income (Y^*) and the equilibrium exchange rate (e^*) by substituting the exchange rate consistent with the BP (e^{BP}) and income consistent with the open economy goods market equilibrium (Y^{NXCA}).

$$Y^* = \frac{1}{\Omega}.\begin{Bmatrix}[\delta^F(z_2 - n_2) + n_2 n_5]ULC + \left(\frac{\delta^F z_3 - n_5 f_3}{1-m}\right).a_0 - (\delta^F z_4 + f_4 n_5).i \\ + \left(\frac{\delta^F z_3 a_6 - n_5}{1-m}\right)f_0 + \delta^F z_0 + (\delta^F - n_5)n_0\end{Bmatrix} \quad (A.7)$$

$$e^* = \frac{1}{\Omega}.\begin{Bmatrix}[\vartheta^M(z_2 - n_2) - \delta^Y n_2].ULC + \left(\frac{\delta^Y f_3 + \vartheta^M z_3}{1-m}\right).a_0 + (\delta^Y f_4 - \vartheta^M z_4).i \\ + \left(\frac{\delta^Y + \vartheta^M a_6 z_3}{1-m}\right)f_0 + \vartheta^M z_0 + (\delta^Y + \vartheta^M)n_0\end{Bmatrix} \quad (A.8)$$

$$\Omega = \delta^Y \delta^F + n_5 \vartheta^M = n_5(1 - z_1 + f_1) + f_5 \delta^Y > 0 \quad (A.9)$$

Where Ω is the equilibrium aggregate demand multiplier, which is unambiguously positive given our equations (A.5) and (A.6). We are mainly interested in the signs of the first derivatives with respect to ULC and a_0, capturing the trade-centred and the finance-centred

channels. ULC affects the trade balance directly via the domestic price level, and indirectly via Y^* and e^* (see equation 1), while asset prices exercise their effect only indirectly through Y^* and e^* (see equation 7.1 and 7.2 in the main text).

$$\frac{\partial Y^*}{\partial a_0} = {Y^*}_a = \frac{1}{\Omega}\left(\frac{\delta^F z_3 - n_5 f_3}{1-m}\right) > 0 \text{ , if } \left(1 + \frac{f_5}{n_5}\right) z_3 > f_3 \quad \text{(A.10.1)}$$

$$\frac{\partial Y^*}{\partial ULC} = {Y^*}_U = \frac{1}{\Omega}[\delta^F (z_2 - n_2) + n_2 n_5] > 0 \text{ , if } \left(1 + \frac{n_5}{f_5}\right) z_2 > n_2 \quad \text{(A.10.2)}$$

$$\frac{\partial e^*}{\partial a_0} = {e^*}_a = \frac{1}{\Omega}\left(\frac{\delta^Y f_3 + \vartheta^M z_3}{1-m}\right) > 0 \quad \text{(A.10.3)}$$

$$\frac{\partial e^*}{\partial ULC} = {e^*}_U = \frac{1}{\Omega}[\vartheta^M (z_2 - n_2) - \delta^Y n_2] < 0 \text{ , if } \left(\frac{z_2}{n_2} < \frac{\delta^Y}{\vartheta^M} + 1\right) \quad \text{(A.10.4)}$$

For (A.10.1) the condition $\left(1 + \frac{f_5}{n_5}\right) z_3 > f_3$ is likely to hold since $f_5 > n_5$ due to the fact that F captures notional financial flows that should react stronger than trade flows to the exchange rate. However, if $f_3 \gg z_3$, i.e. if the effect of asset prices on financial inflows is much larger than of asset prices on domestic demand, ${Y^*}_a$ could turn negative, without further repercussions for our model. The reason is that a strong effect of asset prices on financial inflows would appreciate the currency and thus reduce net exports, thereby contributing to a decline in equilibrium income. Equation (A.10.2) will be positive if z_2 and n_2 are similar in magnitude and will be always satisfied if $z_2 > n_2$. Note that z_2 is an increase in domestic demand due to an increase in ULC, while n_2 is the change in the trade balance due to an increase in ULC. Thus, the condition $z_2 > n_2$ is equivalent to the condition for a wage-led demand regime in the Neo-Kaleckian literature (see Onaran and Galanis, 2012, for indicative values of these parameters). The case of a strongly profit-led regime, i.e. $z_2 < n_2$, where an increase in ULC reduces equilibrium income is equally possible. Importantly, this assumption

has no repercussion on the effect of ULC on equilibrium net exports, as indicated in equation (A.11.2). Equation (A.10.3) is unambiguously positive given the signs of equation (A.5) and (A.6). The sign of equation (A.10.4) is probably the most controversial. It is, however, negative if $\left(\frac{z_2}{n_2} < \frac{\delta^Y}{\vartheta^M} + 1\right)$, which, given that ϑ^M is expected to be small, is most likely to hold. Consequently, an increase in ULC will lead to a nominal depreciation. The reason for that is that our model features a negative effect of an exchange rate appreciation on financial inflows due to the assumption of fundamentalist traders in the foreign exchange market. Therefore, an increase in ULC, while triggering a trade deficit, will at the same time exercise downward pressure on the nominal exchange rate (e) to bring the financial and the trade account into equilibrium. However, the opposite case where $e^*{}_{ULC} > 0$ would also be possible if the effect of a change in ULC on domestic demand is strong (z_2 is large), without further implications for the signs of equations (A.11.1)-(A.11.3).

The effect of our main variables on the trade balance is described by equations (A.11.1)-(A.11.3).

$$\frac{\partial NX^*}{\partial a_0} = \frac{-n_1(\delta^F z_3 - n_5 f_3) - n_5(\delta^Y f_3 + \vartheta^M z_3)}{\Omega(1-m)} < 0 \qquad \text{(A.11.1)}$$

$$\frac{\partial NX^*}{\partial f_0} = \frac{-n_1(\delta^F z_3 a_6 - n_5) - n_5(\delta^Y + \vartheta^M a_6 z_3)}{\Omega(1-m)} < 0 \qquad \text{(A.11.2)}$$

$$\frac{\partial NX^*}{\partial ULC} = \frac{-n_1(\delta^F(z_2 - n_2) + n_2 n_5) - n_5(\vartheta^M(z_2 - n_2) - \delta^Y n_2) - n_2\Omega}{\Omega} < 0 \qquad \text{(A.11.3)}$$

The sign of equation (A.11.1), which denotes a change in net exports in response to an asset price shock, is negative if $(f_5 n_1 z_2 + f_1 n_5\, z_2 + f_5 n_2 > f_5 n_2 z_1)$. This will hold if $0 < z_1 < 1$,

which is akin to the Keynesian stability condition in a closed economy (z_1 is the effect of domestic demand on itself). Similarly, the impact of a financial inflow shock on net exports (equation A.11.2) will be negative if $(a_6 f_5 n_1 z_3 + a_6 f_1 n_5 z_3 + n_5 > n_5 z_1)$ if $0 < z_1 < 1$. Net exports decline due to an increase in ULC (equation A.11.3) if $(f_5 n_1 z_3 + f_1 n_5 z_3 + f_3 n_5 > f_3 n_5 z_1)$, which again will hold if $0 < z_1 < 1$. Importantly, this implies that the signs of equations (A.11.1)-(A.11.3) are independent of the signs for equations (A.10.1)-(A.10.4).

Our model also replicates standard macroeconomic effects such as a positive impact of the interest rate on the exchange rate under certain parameter restrictions. Equation (A.8) shows that the equilibrium exchange rate is a function of the interest rate. Indeed, if $\delta^Y f_4 > \vartheta^M z_4$, an increase in the interest rate will lead to a currency appreciation, via its effects on financial inflows and domestic demand. This would be the case if financial flows are very sensitive with respect to changes in the interest rate (f_4 is large), while they are relatively insensitive with respect to total income (f_1 is relatively small).

Endnotes

[1] f_1 and n_1 would be equal if F were only capturing accounting net financial flows which are by definition equal to net exports. Given that F is capturing 'notional financial flows', i.e. net financial flows that are simply the mirror image of trade flows as well as gross flows that have an impact on the exchange rate (as explained in footnote 4), an increase in Y increases F beyond its impact on trade flows.

Table A.1: Data definition and sources

Variable	Description	Source	Transformation
CA	Balance on current transactions with the rest of the world as % of GDP (real)	AMECO	
PP	Index for Property prices (Base year = 2010)	OECD	Log, DSM
SP	Index for Stock prices (Base year = 2010)	OECD	Log, DSM
i	Short term nominal interest rates	AMECO	Log, DSM
ULC	Nominal unit labour cost index	AMECO	Log, DSM
RULC	Real unit labour costs	AMECO	Log, DSM
NFA	Sum of foreign assets held by monetary authorities and deposit money banks, less their foreign liabilities sector (% of GDP)	World Bank	
FGDP	GDP (in Purchasing Power Standards) of countries in the sample excluding the respective country	AMECO	Log
RELGDP	GDP per capita as a ratio to GDP per capita of the USA	World Bank	Log
DEPR	Ratio of dependents – people younger than 15 or older than 64 – to the working-age population – those aged 15-64. Calculated as the proportion of dependents per 100 working-age population.	World Bank	Log, DSM
GB	Net lending (or net borrowing) of General Government (% of GDP)	AMECO	
CREDIT	Domestic credit to private sector (% of GDP)	World Bank	Log

Notes: Log stands for natural logarithm. DSM stands for the transformation to deviations from the sample mean as discussed in Section 4. CA=current account, PP= property prices, SP=share prices, i=nominal interest rate, ULC=nominal unit labour costs, NFA=net foreign assets, RULC=nominal unit labour costs, RELGDP=GDP p.c. relative to sample mean, DEPR=dependency ratio, GB=government balance, CREDIT=domestic credit/GDP.

Table A.2: Descriptive statistics

Variable	Mean	Std. Dev.	Min	Max
current account	0.246	5.125	-23.299	16.232
property prices	82.760	29.076	25.031	188.915
share prices	92.359	98.968	7.546	1658.693
interest rate	5.611	4.447	0.050	19.880
NFA	0.157	0.712	-0.983	8.014
Nom ULC	81.208	22.705	18.895	174.104
Real ULC	103.957	7.761	89.680	138.036
foreign GDP	18998.050	8822.707	1614.130	31579.500
relative GDP p.c.	0.898	0.324	0.242	2.170
dependency ratio	50.437	4.809	38.099	70.733
government balance	-2.552	4.507	-32.304	18.021
credit	95.580	47.658	0.059	312.154

Table A.3: Pairwise correlation coefficients

	CA	PP	SP	i	NFA	ULC	RULC	FGDP	RELGDP	DEPR	GB
CA	1.00										
PP	-0.40	1.00									
SP	-0.17	0.20	1.00								
i	0.12	-0.05	-0.20	1.00							
NFA	-0.14	-0.08	-0.04	-0.01	1.00						
ULC	-0.12	0.21	0.02	-0.01	-0.17	1.00					
RULC	-0.19	0.11	-0.07	0.03	-0.13	0.49	1.00				
FGDP	-0.18	0.04	0.10	-0.09	-0.05	0.03	-0.04	1.00			
RELGDP	-0.14	0.36	-0.05	0.20	0.00	0.22	0.27	-0.02	1.00		
DEPR	0.01	-0.17	-0.03	-0.02	0.04	-0.02	0.03	0.03	-0.18	1.00	
GB	0.02	0.11	0.14	-0.07	-0.08	0.09	-0.17	0.33	-0.10	0.02	1.00
CREDIT	-0.16	0.19	0.03	0.04	-0.03	0.08	0.16	0.02	0.13	-0.05	0.00

Notes: Variables are taken in differences and transformed according to Table A.1. CA=current account, PP= property prices, SP=share prices, i=nominal interest rate, ULC=nominal unit labour costs, NFA=net foreign assets, RULC=nominal unit labour costs, RELGDP=GDP p.c. relative to sample mean, DEPR=dependency ratio, GB=government balance, CREDIT=domestic credit/GDP.

Table A.4: Unit root tests

Variable	P-value
current account	0.11
property prices	0.07
share prices	0.04
interest rate	0.00
NFA	1.00
Nominal ULC	0.05
Real ULC	0.05
Foreign GDP	1.00
Relative GDP	0.69
Dependency Ratio	0.00
Government Balance	0.00
Credit	1.00
Δcurrent account	0.00
Δproperty prices	0.00
Δshare prices	0.00
Δinterest rate	0.00
ΔNFA	0.00
ΔNominal ULC	0.00
ΔReal ULC	0.00
ΔForeign GDP	0.00
ΔRelative GDP	0.00
ΔDependency Ratio	0.90
ΔGovernment Balance	0.00
ΔCredit	0.00

Notes: The table reports p-values of unit root tests developed by Choi (2001) including a trend. The null hypothesis is that all panels contain a unit root.

Table A.5: Cointegration tests

Test	Common unit-root
Non-parametric variance ratio statistic	-0.525
Phillips and Perron rho-statistic	1.300
Phillips and Perron t-statistic	-0.932
Augmented Dickey-Fuller t-statistic	3.172

Notes: The table reports T-values for cointegration tests for a reduced country sample of 19 countries with the longest time dimension. All test statistics are asymptotically normal distributed with a variance of one and mean of zero under a null-hypothesis of no cointegration.