

UNIVERSITY OF WUPPERTAL  
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EUROPÄISCHE WIRTSCHAFT UND  
INTERNATIONALE MAKROÖKONOMIK  
European Economy and International Macroeconomics



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**New Marshall-Lerner Conditions for an Economy with  
Outward and Two-Way Foreign Direct Investment**

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EIIW Diskussionsbeitrag 248

EIIW Discussion Paper 248



*Europäische Wirtschaft und Internationale Wirtschaftsbeziehungen  
European Economy and International Economic Relations*

ISSN 1430-5445



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Outward and Two-Way Foreign Direct Investment**

July 2018



*Herausgeber/Editor: Prof. Dr. Paul J.J. Welfens, Jean Monnet Chair in European Economic Integration and Chair for Macroeconomics*

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JEL classification: E22, E61, F10, F21, F31, F40, F41

Key words: Trade balance, foreign direct investment, real exchange rate, macroeconomics, economic policy



## Summary

The international debate about trade imbalances often puts the focus on the role of domestic GDP/foreign GDP and the role of real exchange rate changes – with respect to the latter adjustment channel, the standard question is whether or not the Marshall-Lerner condition is fulfilled. With outward foreign direct investment (FDI) and inward FDI becoming increasingly important, the question about the real exchange rate impact on the trade balance has to be restated as imports are proportionate to real gross national income and this indeed implies a new Marshall-Lerner condition. It is shown that with outward cumulated FDI, the modified condition is stricter than the traditional case and with both outward FDI and inward FDI, the elasticity requirement is ambiguous. “FDI globalization” might go along with unpleasant trade imbalance problems so that additional empirical research is needed as well as stronger international policy cooperation as high trade balance deficits/high trade balance surplus positions could be rather difficult to correct through exchange rate adjustments only. Looking at the import elasticities for all partner countries of the US – or country x – together is quite misleading for policymakers.

## Zusammenfassung

Die internationale Debatte zu Handelsbilanzungleichgewichten fokussiert häufig auf die Rolle von inländischem oder ausländischem Bruttoinlandsprodukt und die Rolle realer Wechselkursänderungen – dabei ist mit Blick auf letzteren Anpassungskanal ein gewichtige Standardfrage, ob die Marshall-Lerner Bedingung erfüllt ist. Mit der zunehmenden Bedeutung von Direktinvestitionsabflüssen und Direktinvestitionszuflüssen muss die Frage nach der Rolle des realen Wechselkurses mit Blick auf die Handelsbilanzreaktion neu gestellt werden, da die Güterimporte proportional zum realen Brutto-Nationaleinkommen sind; das bedeutet eine neue, veränderte Marshall-Lerner Bedingung. Gezeigt wird, dass bei kumulierten Auslandsdirektinvestitionen die modifizierte Bedingung strikter als die traditionelle Bedingung ist: Die Direktinvestitionsintensität, die ausländische Gewinnquote und die Größe des Landes relative zum Welteinkommen spielen nun zusätzlich eine wichtige Rolle. Hat man sowohl Zuflüsse wie Abflüsse bei Direktinvestitionen wird die Bedingung uneindeutig. “Direktinvestitions-Globalisierung” könnte von daher mit unerfreulichen Handelsbilanz-Ungleichgewichtsproblemen einhergehen, wobei zusätzliche empirische Forschung notwendig ist; ebenso zudem verstärkte international Politikkooperation, da hohe Defizit- oder Überschusspositionen kaum allein durch reale Wechselkursänderung zu korrigieren sind. Protektionismus-Politik, die zu Direktinvestitionen als Mittel zum Überspringen von Zollmauern führt, unterminiert die Handelsbilanzanpassung via reale Wechselkurse. Wenn man die Importelastizitäten für alle Handelspartner zusammen betrachtet, ist das irreführend für die Politik.



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## **New Marshall-Lerner Conditions for an Economy with Outward and Two-Way Foreign Direct Investment**

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## Acknowledgements

I am grateful to research support by Vladimir Udalov, Oliver Ebbers, Lev Nazarov and Fabian Baier as well as editorial editing by David Hanrahan (EIIW); previous discussions with Tamim Bayoumi (IMF) on trade imbalances have been useful; I also appreciate the encouraging debate on trade imbalances at an ECB expert group meeting. I am also grateful for suggestions by Volker Clausen, University Duisburg-Essen; and for discussions with participants at the international conference “Sustainability of Regional Integration and ASEAN: Weakening Multilateralism?” in Bangkok/ Chulalongkorn University, July 9/10, 2018. The usual caveat applies.



# 1. Introduction

The reaction of the trade balance with respect to a rise of the real exchange rate has traditionally been an important aspect in International Macroeconomics, particularly when the question relates to how to correct a relatively large trade balance deficit. This topic has become quite important as an economic policy aspect since Donald Trump's election as President of the United States in January 2017. The international debate over the trade balance deficit of the US has many aspects and part of the discussion actually seems not to be in line with standard macroeconomic analysis. The Council of Economic Advisers has summarized some key views of the Trump Administration in its 2018 report (COUNCIL OF ECONOMIC ADVISERS, 2018). An important point that has thus far been overlooked in the discussion altogether is the role of (cumulated) foreign direct investment (FDI) and the associated necessary distinction between gross domestic product (GDP) and gross national product (GNP). For the analytically rather transparent case of asymmetric outward FDI, a new Marshall-Lerner condition can be derived; and it has some obvious policy relevance for a major FDI source country such as the US. The more complex case of both inward and outward cumulated FDI can also be analyzed with respect to the trade balance and a modified Marshall-Lerner condition. It can be shown that the case of both outward FDI and inward FDI could make the requirement on the sum of import elasticities stricter or the standard requirement is, depending in parameter values, attenuated: The sum of the absolute import elasticities with respect to the exchange rate must exceed more than unity in the case of outward FDI and if one adds inward FDI, the requirement could become stricter. It cannot be ruled out that trade imbalances in the new world of twin globalization – namely both trade globalization and FDI globalization – is much more difficult to correct through the real exchange rate mechanism so that more adjustment pressure would have to fall on differential output growth at home and abroad, respectively. With more and more countries from the OECD group, as well as many Newly Industrialized Countries and China becoming active as both FDI host and as source countries, the subsequent considerations seem to be quite important.

Why is the size of import elasticities (in absolute terms) so important? When faced with an unsustainable trade balance deficit, government policymakers indeed look at these figures; and if the IMF considers the external position of a country as unsustainable, these elasticities are crucial and thus included in Article IV Reports and other surveillance activities – often with a focus on the current account and on trade balance figures. Indeed as the IMF (2006, p.3) has noted with respect to medium income countries: *“Estimates of the impact of exchange rate movements on the trade balance are central to the Fund’s surveillance and program design work.”* One may emphasize the following point made by the authors: As regards trade balance adjustment, it seems that in middle-income countries an improvement can typically be achieved through the import side which seems to have a higher responsiveness than the goods export side of many countries; industrialized countries are often characterized by the pricing to market behavior of firms so that nominal exchange rate changes are not fully passed on to customers abroad. The authors also write (IMF, 2006, p.4): *“While there is an extensive academic literature on estimating “trade equations”..., most studies focus on specific goods, or on imports, or on exports (but not both), making it difficult to infer the impact on the aggregate trade balance. Yet, from a*

*macroeconomic perspective, it is this aggregate effect that is of importance.*” The following analysis is rather compact and simply asks the question of how the traditional Marshall-Lerner condition has to be changed – ignoring pricing to market behavior aspects and thus simply focusing on real exchange rate changes – if outward foreign direct investment or inward FDI or two-way FDI has to be considered in a broader globalization perspective. The key focus is on the trade balance, but one can certainly extend the analysis to the current account and the exchange rate equilibrium condition, respectively; and from this, to a macro model there are only a few steps as mentioned in the final section.

At the bottom line, the new Marshall-Lerner condition derived here for the case of outward FDI suggests a critical limit that exceeds the previous limit of unity by about 15% - while the cases of pure inward FDI and two-way FDI are not so clear; here, FDI globalization could lead to a requirement where the limit for the sum of the two elasticities, in absolute terms, is below unity. Note, however, the unambiguous finding for the case of a setting with outward FDI: the interplay of the FDI intensity abroad, the foreign profit share in GDP and the share of a country’s GDP in global GDP play a key role for the stricter new Marshall-Lerner condition derived.

The next section derives the Marshall-Lerner conditions for a world with FDI before the final section draws key policy conclusions. When one looks at the setting with outward FDI (only), the main insight is that a real devaluation will reinforce imports of goods and services as the real value of profits from abroad (country 2), expressed in domestic goods units of country 1, will increase and therefore there is a stricter requirement on import elasticities than the standard Marshall-Lerner condition suggests. As regards a two-way FDI setting, one can show that a real exchange rate devaluation in country 1 additionally dampens the GNP in country 2 and therefore makes exports of country 1 more difficult: Thus the potentially even stricter requirement for a trade balance improvement in the two-way FDI case. To the extent that one is more interested in the reaction of the current account to a real depreciation, one may point out that “FDI globalization” is weakening the traditional Marshall-Lerner condition provided that profits of subsidiaries abroad really are fully transferred to the parent companies; if the international transfer of profits takes place only to a rather small extent (for example due to tax incentives in favor of reinvestment abroad which in reality plays a crucial role in some countries, e.g. in China since 2018) – smaller than certain trade parameters – the standard finding presented here, namely that FDI globalization leads to a stricter Marshall-Lerner condition than the traditional elasticities requirement, is maintained under certain parameter restrictions. Moreover, in a policy perspective, one has no really useful information if the elasticity of imports of country  $i$  vis-à-vis all countries ( $j=1, 2\dots N$ ) is considered, rather one has to make a distinction across partner countries, namely which pair  $i$ - $j$  stands for pure outward FDI (from a country 1 perspective), alternatively those which stand for the case of pure inward FDI and finally – a third country group – representing a two-way FDI case. The following theoretical analysis is also an implicit derivation of the standard trade gravity model – without the distance variable; this is so because in a world with cumulated outward and inward FDI, the import volume will depend on both domestic and foreign GDP.

The subsequent analysis is not a general equilibrium approach, but the building blocks developed here should be easily incorporated in such a more complex approach. As regards recent estimates of the export price elasticities of China, France, Germany, Italy, Japan,

UK and the US – over the period 1990-2012 – AIELLO/BONNANO/VIA (2015) have shown that these elasticities are below unity both in the short run and the long run; except for France where the export price elasticity is lower than unity in the short run, but higher than unity in the long run. Looking at large exchange rate changes in a macro perspective yields important results for both high income countries and developing countries (KAPPLER ET AL., 2013). There are also special aspects concerning real domestic income versus real GDP in terms of trade changes as pointed out by KOHLI (2004) with a focus on both Switzerland and other countries. Subsequently the distinction between GDP and GNP will, however, play an important role.

The following analysis suggests that a more differentiated approach to export price elasticity/import price elasticity analysis could be very useful. It is clear that estimations of price elasticities could be based on import volumes or on real value-added imports where the latter are imports net of foreign intermediate imports. A standard analysis of the real exchange rate elasticity of the trade balance for Germany, before and after the creation of a monetary union, has been provided by the Monthly Reports of January 1997/1998 where the 1998 Monthly Report (DEUTSCHE BUNDESBANK, 1998) suggests that the elasticities on the German export side is greater in absolute terms than on the import side – strongly influenced by raw materials; and that the elasticities for trade with the Eurozone partner country group differs from that of the non-Eurozone/non-EU countries.

## **2. Deriving the modified Marshall-Lerner Condition for the Case of Outward FDI**

The standard Marshall-Lerner (henceforth referred to as ML) condition says that the trade balance will improve after a real depreciation (real exchange rate  $q^*=eP^*/P$  falls;  $e$  is the exchange rate,  $P$  the price level,  $*$  for foreign variable) if the sum of import elasticities – in absolute terms - in the home country and abroad exceed unity. Many empirical studies have found that the ML condition is not met in the short term but in the long run as adjustment, in the sense of looking for a broader range of substitutes for imported products, takes some time. In an economy with trade and FDI there is a need to make a distinction between real gross domestic product  $Y$  and real gross national income  $Z$ .

Subsequently, it will be shown that in an economy with cumulated outward foreign direct investment, the condition for the trade balance to improve after a real devaluation is different from the standard ML condition since export volume  $X$  is not proportionate to the foreign real gross domestic product  $Y^*$  but to real foreign gross national product  $Z^*$ . Real gross national product  $Z = Y$  plus net income from abroad where subsequently at first only dividend income from abroad is considered; and the import volume  $J$  is assumed to be proportionate to  $Z$ .

Let us consider the case of asymmetric cumulated outward FDI (share in foreign capital stock is denoted by  $\alpha$ ); the question is how the ML condition has to be modified in the context of a change of the trade balance  $X'$  and the trade balance ratio (TBR), respectively;

TBR is defined as import of goods and services in country 1 units relative to real exports of country 1. It is assumed that the absolute terms for the import elasticities at home and abroad exceed zero. A critical assumption made here is that the sum of the import elasticities at home and abroad in absolute terms – as a new requirement – is smaller than 2; if the sum of elasticities would exceed 2, one has a different case to be studied. The import elasticity in absolute terms is denoted by  $\eta$  and  $\eta^*$ , respectively.

If one considers the trade balance in a standard setting – without foreign direct investment – we can write for the export-import ratio  $X/(q^*J)$  as simple expression ( $q^*J$  is the import volume expressed in domestic goods units (parameters  $x>0$ ,  $j>0$ )); specifying  $X = xY^*q^{*\eta^*}$  and imports  $J = jYq^{*\eta}$  we get for the export-import ratio  $X/(q^*J) = xY^*q^{*\eta^*}/(q^*jYq^{*\eta})$ . Thus taking logs gives  $\ln(X/(q^*J)) = (\eta^* + \eta - 1) \ln q^* + \ln(x/j) + \ln(Y^*/Y)$ . Hence the export-import ratio will improve after an increase of the real exchange rate only if  $\eta^* + \eta > 1$ . This is the ML condition. In a world with foreign direct investment one has to consider that exports and imports are proportionate to  $Z^*$  and  $Z$ . If output is produced in both countries according to a Cobb-Douglas production function – as assumed here  $Y=K^\beta(AL)^{1-\beta}$  and  $Y^*=K^{*\beta^*}(A^*L^*)^{1-\beta^*}$ ;  $K$  is capital,  $A$  knowledge,  $L$  labor,  $0<\beta<1$ ,  $0<\beta^*<1$ ) – and if there is competition in goods and factor markets the capital income share in GDP is  $\beta$  in the home country and  $\beta^*$  in the foreign country (note: the new ML condition derived is independent of the Cobb-Douglas functions considered here).

These aspects are important for deriving a modified Marshall-Lerner condition for the case of outward FDI as has already been emphasized by WELFENS (2012) where both inward FDI and outward FDI were considered and the importance of the distinction between GDP and real GNP emphasized (WELFENS, 2011). Subsequently, only outward FDI is considered at first and it can be shown how the modified Marshall-Lerner condition should read. It will be assumed that the standard ML is fulfilled, but it will be shown additionally that the sum of the two import elasticities – in absolute terms – will have to remain above a specific critical value (above unity, but below 2) if a real devaluation is to improve the trade balance. In the subsequent trade balance, no international profit transfers are included (one should also remember that until the end of 2017 the US had tax incentives encouraging firms not to repatriate large profits of foreign subsidiaries). This aspect could be considered more explicitly when considering the current account balance. Subsequently the import-export ratio is considered for the case of cumulated outward foreign direct investment.

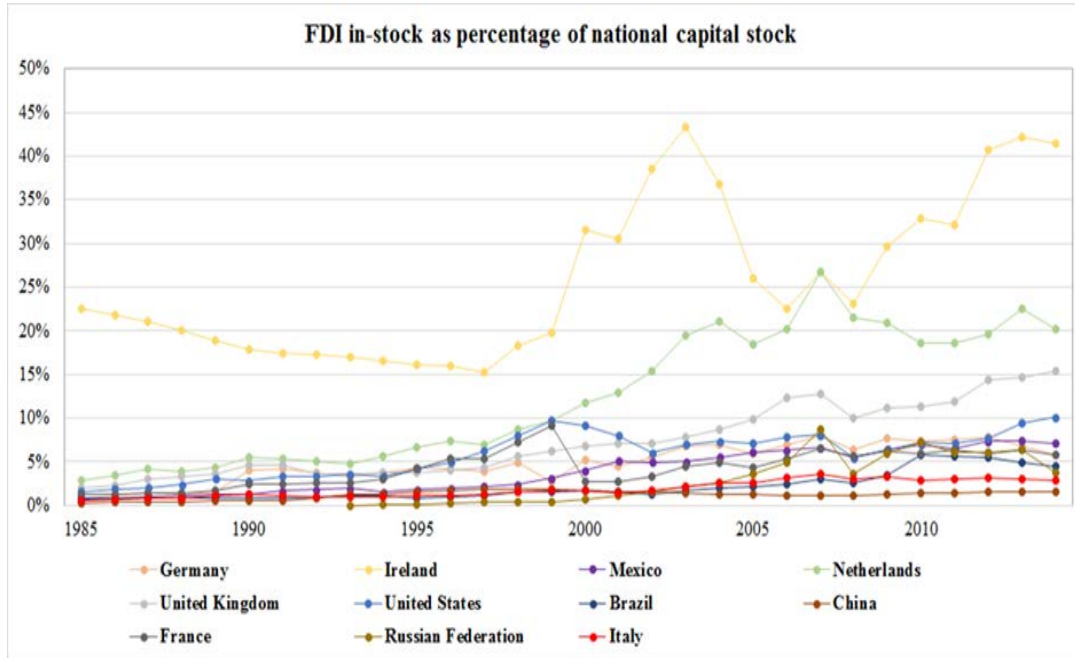
At the outset it is assumed that the sum of the import elasticities – in absolute terms - is below 2. Note that  $Z$ , expressed in domestic goods units, is given by  $Z= Y + \alpha\beta^*Y^*q^*$ ; multiplying profits of subsidiaries abroad by  $q^*$  translates foreign goods units into goods units of country 1. For ease of exposition in equation (5') the ratio of  $q^*J/X:=TBR$  (trade balance ratio) is considered so that the modified Marshall-Lerner condition to be derived will consider the condition of  $\partial TBR/\partial q^*<0$ . If one would consider the trade balance in real terms  $(X';$  parameters  $0<x<1;$   $0<j<1)$ , one gets  $X' = xY(1-\alpha\beta^*)q^{*\eta^*} - q^*jYq^{*\eta} - \alpha\beta^*jY^*q^{*2-\eta}$  where the latter term (beyond the factor  $(1-\alpha\beta^*)$  in the export term) is the new element crucial for the necessary modification of the Marshall-Lerner condition in a setup with outward cumulated FDI. With such FDI, imports also depend on foreign GDP and part of imports will react very sluggishly to a real exchange rate change in the sense that only under the extreme case of  $\eta>2$  would one see

an impulse from this term for an improvement of the trade account. The larger  $\alpha\beta^*$ , the higher the FDI-induced reduction of the export term and the larger the unfavorable third term – assuming that  $\eta > 2$  is an unrealistic case. For the understanding of the subsequent analysis it should be clear that, for example, the import volume of, say oil, of the EU or the US, is indeed the real import volume, namely measured in barrels of oil (foreign goods units).

The setup of subsequent equations is clear and (15') gives the result – with  $\lambda := Y/(q^*Y^*)$  – of the new Marshall-Lerner condition of an economy with outward FDI:  $\eta^* + \eta > 1 + 1/(1+\lambda/(\alpha\beta^*))$ . As the derivation is based on the assumption that the sum of both import elasticities exceeds unity, one may indeed write:  $\eta^* + \eta > 1 + 1/(1+\lambda/(\alpha\beta^*))$  which is a stricter condition than the standard Marshall-Lerner condition.

In a world economy with an increasing role of foreign direct investment, the new Marshall-Lerner condition is crucial; it should be useful to understand the reaction of the trade balance of major FDI source countries, particularly with respect to trading partners which themselves have rather low (or indeed zero) outward FDI. To get an idea of the order of magnitude of outward foreign direct investment stocks, some selected statistics for certain countries have been indicated in the subsequent graph – with a focus on inward FDI intensity (cumulated FDI inflows relative to capital stock of host country); appendix 2 also gives information on selected outward FDI stock positions. It is also interesting to take a look at the current account – with a setup of actual international dividend payments.

**Figure 1: Foreign Direct Investment Ownership in Selected Countries**



Source: EIIW calculations based on data available from UNCTAD and Penn World Table, Version 9.0

The derivation of the new Marshall-Lerner condition for the case of outward FDI is as follows:

$$(1') X = xZ^* q^{*\eta^*}$$

$$(2') J = jZq^{*\eta}$$

$$(3') Z = Y + \alpha\beta^* Y^* q^*$$

$$(4') Z^* = Y^* (1 - \alpha\beta^*)$$

$$(5') TBR = \frac{q^* jZq^{*\eta}}{xZ^* q^{*\eta^*}}$$

$$(6') TBR = \frac{q^* j(Y + \alpha\beta^* Y^* q^*) q^{*\eta}}{xZ^* q^{*\eta^*}} = \frac{q^* jYq^{*\eta} + q^* j\alpha\beta^* Y^* q^* q^{*\eta}}{xZ^* q^{*\eta^*}} =$$

$$= \frac{q^* jYq^{*\eta}}{xZ^* q^{*\eta^*}} + \frac{q^* j\alpha\beta^* Y^* q^* q^{*\eta}}{xZ^* q^{*\eta^*}} = \frac{q^{*1-\eta^*-\eta} jY}{xZ^*} + \frac{q^{*2-\eta^*-\eta} j\alpha\beta^* Y^*}{xZ^*}$$

$$(7') \frac{\partial TBR}{\partial q^*} = (1 - \eta^* - \eta) \frac{jY}{xZ^*} q^{*\eta^*-\eta} + (2 - \eta^* - \eta) \frac{j\alpha\beta^* Y^*}{xZ^*} q^{*1-\eta^*-\eta}$$

$$(8') \frac{\partial TBR}{\partial q^*} < 0 \text{ if } (1 - \eta^* - \eta) \frac{jY}{xZ^*} q^{*\eta^*-\eta} < (\eta^* + \eta - 2) \frac{j\alpha\beta^* Y^*}{xZ^*} q^{*1-\eta^*-\eta} \bullet xZ^*$$

$$(9') (1 - \eta^* - \eta) \left[ \frac{Y}{\alpha\beta^* (\eta^* + \eta - 2) Y^* q^*} \right] > 1$$

This requirement for a normal reaction of the trade balance with respect to a real depreciation is stricter than the traditional Marshall-Lerner condition ( $\eta + \eta^* > 1$ ) since we can write (recall the assumption that the sum of the absolute import elasticities is below 2):

$$(10') 1 - \eta^* - \eta < \alpha\beta^* (\eta^* + \eta - 2) (q^* Y^* / Y)$$

$$(11') \eta^* + \eta > 1 + \left[ \alpha\beta^* (2 - \eta^* - \eta) (q^* Y^* / Y) \right]$$

Equation (11') already shows that the FDI-enhanced ML condition will be stricter than the standard ML condition.

Let us define  $Y/(q^* Y^*) := \lambda$  which is the ratio of home country GDP relative to foreign GDP (in home country units) or implicitly the initial share of the home country in the world economy. We divide equation (10') by  $1 - \eta^* - \eta$  (assuming  $(1 - \eta^* - \eta) < 0$ ) and thus obtain as the case of the modified Marshall-Lerner condition (assuming  $1 < \eta^* + \eta < 2$ ):

$$(12') \lambda / (\alpha\beta^*) > -1 - \frac{1}{(1 - \eta^* - \eta)}$$

$$(13') 1 + \lambda / (\alpha\beta^*) > -\frac{1}{(1 - \eta^* - \eta)}$$

$$(14') \quad 1 - \eta^* - \eta < - \frac{1}{\left(1 + \frac{\lambda}{\alpha\beta^*}\right)}$$

$$(15') \quad \eta^* + \eta > 1 + \frac{1}{1 + \frac{\lambda}{\alpha\beta^*}}$$

The higher  $\lambda$  and the smaller  $\alpha$  and  $\beta^*$ , the easier it is for the modified ML condition to be fulfilled. The term  $1/(1+\lambda/(\alpha\beta^*))$  can be defined as  $V'$ . If  $\lambda = 0.2$ ,  $\alpha = 0.1$  and  $\beta^* = 0.33$  – these figures correspond roughly to the case of the US or the EU – the sum of the absolute import elasticities should be above a critical upper value of  $1 + 1/(1+\lambda/(\alpha\beta^*)) = 1.142$  (and, recall, above unity) to fulfill the FDI-modified Marshall-Lerner condition with respect to the trade balance. For a much smaller country (say  $\lambda = 0.02$ ) one has to consider that typically  $\alpha$  is also smaller (say  $\alpha = 0.01$ ) so that roughly the same critical range for a modified Marshall-Lerner condition for a trade balance improvement in a small country as for a big economy might be obtained; the relevant statistics for the countries concerned have to be studied. A kind of new elasticity pessimism in a world of trade and outward FDI could be justified only if  $\beta^*$  and  $\alpha$  would rise over time, while  $\lambda$  is constant or declining. Empirical analysis is required to shed further light here.

### 3. Policy Conclusions and Further Research

It is fairly obvious that in an economy with asymmetric outward FDI, the change of the size of the import elasticities over time – small in the short term, higher in the medium term and even larger in the long run – could become a distinct source of output instability in an underemployed economy as  $Y = C(\dots) + I(\dots) + G + X_{net}(Y, Y^*, q^*)$ ; here,  $X_{net}$  is the real trade balance. The elasticity of  $X_{net}$  with respect to  $q^*$  might be negative in the short run, but is possibly above unity in the medium and long run. Finally, one may note that the tendency of firms to create international production networks could contribute to rather small import elasticities in absolute terms (but the sum of import elasticities in a North-South perspective could still exceed unity – where countries in the South export intermediate products and import final products which contain those intermediate products).

Protectionist policies causing tariff-jumping FDI could undermine trade balance adjustment via the real exchange rate: If, for example, the Trump Administration complains about a large US trade imbalance and then imposes import tariffs on metals and certain products – or simply threatens to do so with more products – this is quite contradictory not only because Trump's economic policy stimulates output and hence imports so that the trade imbalance will indeed increase due to the President's economic policy; but it also reinforces the globalization terms in the modified Marshall-Lerner condition for the two-way FDI case (see appendix 1) so that real exchange rate changes have to be bigger for a corrective impact than would otherwise be the case. Thus the Trump Administration implicitly pushes for higher global exchange rate volatility which in

turn could cause higher output volatility and hence additional welfare losses worldwide – one can be certain that the key trade policy advisers of President Trump have not considered these aspects thus far. The simple arguments presented here might have an enlightening effect on policymakers interested in dealing with trade imbalances in an adequate and rational way.

As regards the theoretical result for the two-way FDI case, one can see from the modified ML result (8".2) that it is unclear whether or not the modified Marshall-Lerner condition is stricter than the traditional ML condition. The appendix also shows a fairly compact condition for the case of pure inward FDI to lead to a stricter modified condition than a traditional ML condition. Empirical research about the various parameter restrictions would be useful and in any case one should not expect the Marshall-Lerner condition in the context of FDI globalization situation to be the same as in the case of a pure trade globalization setting. One may argue that it will be interesting to observe how long it takes for the sum of the two import elasticities in absolute terms to meet the modified stricter ML-requirement. All the import elasticity conditions are, of course, also quite relevant in the context of import tariffs which change the international relative price  $q^*(1+b''\tau'')/(1+b''*\tau''*)$  where  $\tau''$  is the import tariff rate of country 1 and  $\tau''*$  is the foreign import tariff rate;  $b''$  and  $b''*$  are pricing-to-market parameters and could be in the range of -1 to +1. If import tariffs are imposed only by country 1, there will be a real appreciation effect in a system of flexible exchange rates and this, in turn, will reverse the initial trade balance improvement from imposing sectoral import tariffs – provided that the modified ML conditions are met. Two-way FDI countries as well as cases of countries with asymmetric FDI (either only/mainly outward FDI or only/mainly inward FDI) should be studied carefully. It will be crucial to consider bilateral and global trade balance/current account balance adjustment options for countries which are both major source and host countries of FDI, such as the US, Canada, Switzerland, most western EU countries, Korea, Japan, Singapore and other ASEAN countries as well as China.

Obviously, an interesting challenge for future research would be to find out for which countries the medium term witnesses the case that the sum of absolute import elasticities exceed the critical value  $1+V'$ . The relevant empirical results will bring interesting policy conclusions when it comes to the debate about critical trade imbalances. One may point out that there is also an interesting question with respect to equilibrium in the foreign exchange market as one can write as an equilibrium condition – with portfolio capital inflows  $V(r-r^*)$  and foreign direct investment inflows in the form of FDI inflows (international mergers & acquisitions)  $V''q^*$ :  $V(r-r^*) + V''q^* = q^*jZq^* - xZ^*q^*$  where  $V>0$ ,  $V''>0$ . The term  $V''q^*$  reflects the argument of FROOT/STEIN (1991) according to which FDI inflows in a setup with imperfect capital markets are a positive function of the real exchange rate as the foreign bidders – facing competition of domestic bidders in the target country – will have higher equity capital (expressed in the currency of the target country) after a real depreciation of the foreign currency. The above condition for an equilibrium in the foreign exchange market has been stated here without international profit payments; if those are to be included, one has to add on the RHS  $v'\alpha*\beta Y$  ( $v'$  and  $v''*$  stand for the percentage of profits repatriated by subsidiaries in country 1 and country 2, respectively) and also the additional term –  $v''*\alpha*\beta Y^*q^*$ . These are interesting perspectives for macroeconomic modeling and indeed, for example, for an enhanced Mundell Fleming model with outward FDI. In the goods market, consumption would be proportionate to disposable GNP.



Investment could be written as  $b(\beta Y/K - r - \delta)$  where  $b$  is a positive parameter and  $\beta Y/K$  is the marginal product of capital if the macro production function is  $Y=K^{\beta}(AL)^{1-\beta}$ ;  $\delta$  is the depreciation of  $K$ .

Whether or not a real depreciation leads to an improvement of the real current account position in the medium term is for instance crucial to the case of BREXIT (WELFENS, 2017). Some aspects of the link between the current account and real depreciation in the context of inward FDI and outward FDI are mentioned in the appendix. As regards BREXIT, it is clear that the real depreciation to be expected from BREXIT could, on the one hand, improve the current account of the UK in the medium term, on the other hand a rather limited free trade agreement between the UK and the EU will raise the UK's current account deficit. This in turn would shift the  $F^*F^*$ -curve in the Branson model upwards which simultaneously determines the equilibrium in the money market, the domestic bonds market and the foreign bonds market - with the  $F^*F^*$ -curve indicating in  $e-i$  space ( $i$  is the nominal interest rate which in a setting with a stable price level is equal to the real interest rate  $r$ ) the equilibrium condition in the foreign bonds market while the MM-curve indicates the equilibrium condition in the money market. A fall of the stock of foreign bonds ( $F^*$ , denominated in foreign currency) due to a current account deficit implies a downward shift of the MM-curve (and possibly also a downward rotation) so that the fall of  $F^*$  due to a current account deficit will in any case lead to an interest rate increase and most likely also to a nominal depreciation of the currency.

At the bottom line it is clear that looking empirically at the Marshall-Lerner condition for all trading partner countries on an aggregated basis does not make much sense. The trading partners will have to be grouped according to the FDI links and dominant FDI directions, respectively. Partners where country 1 is mainly a source country of FDI, countries where country 1 is mainly a host country, and the case of mixed FDI relations. A disaggregated set of estimates for import elasticities for the three groups mentioned has to be analyzed – otherwise the results of lumped countries would be quite misleading for policymakers. It is also clear that the dominant FDI position of a pair of countries can change over time: For example, in 2000 the US still was dominantly a host country of FDI for China while in 2016 there was more of a two-way FDI relationship between the two countries. A similar view is relevant for EU-Sino trade and the FDI relations at these two points of time. All of this does not, of course, consider the impact of changing trade composition over time on the absolute size of import elasticities. One may assume that countries with strong MNC production activities have rather low absolute import elasticities for imports from subsidiaries abroad – reflecting off-shoring - since intra-company trade with intermediate products should be highly specialized and complementary (the latter referring to the intermediate product and the final good produced). MNCs' imports from international outsourcing partners should, however, stand for rather high import elasticities since the level of technological sophistication and knowledge-intensity typically will be lower than for the import of intermediate products in the context of offshoring.

The most important case to study regarding the relevance of the new Marshall-Lerner condition is the UK for which BREXIT will bring about considerable economic challenges, including strong real exchange rate movements. However, as was already visible in the EU referendum year of 2016, a real Pound depreciation brings a high FDI inflow, while a year later – with public interest focused more on the question of future UK market access to the EU27 – FDI inflows had reduced enormously (according to OECD: -

92% compared to 2016; -18% for the global FDI inflow (OECD, 2018)) while outward UK FDI had strongly increased; possibly showing first signs of tariff-jumping investment by UK firms. The new Marshall-Lerner condition will help to better understand trade and current account adjustments.

Naturally, the aspects highlighted above will be quite important for national policymakers eager to cope with unsustainable trade balances; and the IMF should indeed consider the new results which require splitting countries into a mainly FDI source country group, dominantly FDI host country group and a two-way FDI mixed group of countries (see appendix 3 where some countries shown for the case of the US in a dominant source country position concerns relatively poor countries such as India, Brazil and Malaysia, but other countries are advanced countries) – this would be a deviation from the standard split of countries into high income countries, low income countries, emerging economies and natural resource exporters.

## Appendix 1: Outward and Inward FDI: More Restrictive New Marshall Lerner Condition

The initial point of reference is the trade balance for the case of outward cumulated FDI: Net real exports of goods and services  $X'$  can be written as:

$$(1'') X' = xZ^* q^{*\eta^*} - q^* j[Y + \alpha\beta^* Y^* q^*] q^{*\eta^*}$$

However, with inward and outward FDI, the definitions of  $Z^*$  and  $Z$  are as follows:

$$(2'') Z^* = Y^*(1 - \alpha\beta^*) + \alpha^* \beta Y / q^*$$

$$(3'') Z = Y(1 - \alpha^* \beta) + \alpha\beta^* Y^* q^*$$

$$(4'') X' = x[Y^*(1 - \alpha\beta^*) + \alpha^* \beta Y / q^*] q^{*\eta^*} - q^* j\{Y(1 - \alpha^* \beta) + \alpha\beta^* Y^* q^*\} q^{*\eta^*}$$

The total differential yields for given  $Y$  and  $Y^*$ :

$$(5'') dX' / dq^* = \eta^* q^{*\eta^*-1} x(Y^*(1 - \alpha\beta^*) + \alpha^* \beta Y / q^*) - q^{*\eta^*} x\alpha^* \beta Y / q^{*2} - ((1 - \eta)q^{*\eta^*} j(Y(1 - \alpha^* \beta) + \alpha\beta^* Y^* q^*) + q^{*1-\eta} j\alpha\beta^* Y^*)$$

$$(6'') dX' / dq^* = \eta^* q^{*\eta^*-1} x(Y^*(1 - \alpha\beta^*) + \alpha^* \beta Y / q^*) - q^{*\eta^*} x\alpha^* \beta Y / q^{*2} - ((1 - \eta - \eta^*)q^{*\eta^*} j(Y(1 - \alpha^* \beta) + \alpha\beta^* Y^* q^*) + q^{*1-\eta} j\alpha\beta^* Y^*) - \eta^* q^{*\eta^*} j(Y(1 - \alpha^* \beta) + \alpha\beta^* Y^* q^*)$$

Hence we have for the modified Marshall-Lerner condition in the case of two-way FDI:

$$(7'') dX' / dq^* = \eta^* q^{*\eta^*-1} x(Y^*(1 - \alpha\beta^*) + \alpha^* \beta Y / q^*) - q^{*\eta^*} x\alpha^* \beta Y / q^{*2} - ((1 - \eta - \eta^*)q^{*\eta^*} j(Y(1 - \alpha^* \beta) + \alpha\beta^* Y^* q^*) + q^{*1-\eta} j\alpha\beta^* Y^*) - \eta^* q^{*\eta^*} j(Y(1 - \alpha^* \beta) + \alpha\beta^* Y^* q^*) > 0$$

This requires (with  $H := q^{*\eta} j \{ Y(1 - \alpha^* \beta) + \alpha^* \beta Y^* q^* \}$ ):

$$(8'') \quad -[\eta^* q^{*\eta^{*-1}} x(Y^*(1 - \alpha^* \beta) + \alpha^* \beta Y / q^*) + q^{*\eta^*} x \alpha^* \beta Y / q^{*2} - q^{*1-\eta} j \alpha^* \beta Y^*] / H + \eta^* < -1 + \eta + \eta^*$$

$$(8''.1) \quad \eta + \eta^* > 1 - [\eta^* q^{*\eta^{*-1}} x(Y^*(1 - \alpha^* \beta) + \alpha^* \beta Y / q^*) + q^{*\eta^*} x \alpha^* \beta Y / q^{*2} - q^{*1-\eta} j \alpha^* \beta Y^*] / H + \eta^*$$

The two-way FDI case is rather tedious in terms of the RHS. The terms which would make the modified Marshall-Lerner conditions stricter are  $-q^{*1-\eta} j \alpha^* \beta Y^* / H + \eta^*$ . Hence a relatively large import ratio  $j$  could lead to such a stricter case. The other elements of the squared bracket term would attenuate the elasticity requirement. If  $\alpha$  is zero, so that one has the case of asymmetric inward FDI leads to the following equation

$$(8''.2) \quad \eta + \eta^* > 1 - [\eta^* q^{*\eta^{*-1}} x(Y^* + \alpha^* \beta Y / q^*) + q^{*\eta^*} x \alpha^* \beta Y / q^{*2}] / H + \eta^*$$

The conclusion is that for the case that the squared bracket term/H is smaller than  $\eta^*$  the modified Marshall-Lerner condition for an economy with inward FDI is stricter than the traditional ML condition.

### ***Basic Current Account Aspects of a Real Devaluation***

It should be noted that one could also consider the current account (CA:= current account) adjustment problem in the sense that a similar approach would be useful to determine the condition for  $dCA/dq^* > 0$ . On the supply side for foreign exchange we have the profits accruing from subsidiaries abroad ( $\alpha^* \beta Y^* q^*$ ), on the demand side for foreign exchange we have the profits of foreign subsidiaries in the home country ( $\alpha^* \beta Y$ ). The relevant CA elasticity condition is crucial since the current account is the relevant condition for the development of foreign indebtedness over time – once there is a current account deficit. If one considers the current account with both cumulated inward FDI and cumulated outward FDI, the additional terms is the term for profit transfers from subsidiaries abroad, namely  $v' \alpha^* \beta Y^* q^*$  - where  $v'$  ( $0 < v' < 1$ ) is the percentage of profits made abroad that is transferred to parent companies and which therefore contributes to an additional supply of foreign exchange; at the same time there is a second term  $v'' \alpha^* \beta Y / q^*$  where  $v''$  ( $0 < v'' < 1$ ) is the share of profits of subsidiaries in country 1 that is transferred to the parent companies in country 2.

## Appendix 2: Selected Outward FDI Stock Data (% of Source Country Capital Stock)

**Table 1: Outward FDI Stock as Percentage of the Source Country Capital Stock. 1980 vs 2014**

Country	Outward FDI Stock available since:	Outward FDI Stock as Percentage. in 1980:	Rank 1980:	Outward FDI Stock as Percentage. in 2014:	Rank 2014:
British Virgin Islands	1998			24384.90%	1
Cayman Islands	1980	10.5%	1	824.81%	2
Malta	1992			171.47%	3
Cyprus	1987			126.09%	4
Luxembourg	2002			90.62%	5
China. Hong Kong SAR	1980	0.1%	31	87.14%	6
Ireland	1985			61.70%	7
Switzerland	1983			60.65%	8
Liberia	1980	7.5%	5	39.59%	9
Singapore	1980	1.2%	17	39.59%	10
Netherlands	1980	7.7%	4	29.51%	11
Barbados	1980	0.4%	22	24.34%	12
Sweden	1980	0.9%	21	23.37%	13
Belgium	1980	1.4%	16	19.66%	14
Canada	1980	2.8%	8	17.41%	15
Iceland	1985			15.89%	16
United Kingdom	1980	3.5%	7	15.82%	17
Denmark	1980	0.9%	20	15.12%	18
Norway	1980	0.3%	26	13.50%	19
Austria	1980	0.2%	29	12.27%	20
United States	1980	2.3%	9	11.56%	21
Australia	1980	0.9%	19	11.03%	22
Finland	1980	0.3%	24	10.69%	23
France	1980	1.2%	18	10.57%	24
Israel	1980	0.0%	40	9.80%	25
Germany	1980			9.48%	26
Bahamas	1998			8.73%	27
Taiwan (Province of China)	1980	8.5%	3	8.47%	28
Azerbaijan	1996			8.46%	29
Chile	1980	0.1%	32	8.09%	30

Bermuda	1997			7.28%	31
Malaysia	1980	0.4%	23	6.80%	32
Kuwait	1980	2.1%	10	6.79%	33
South Africa	1980	1.4%	15	6.41%	34
Japan	1980	1.7%	13	6.18%	35
Bahrain	1980	3.5%	6	6.10%	36
Togo	1998			6.00%	37
Spain	1980	0.2%	30	5.98%	38
Russian Federation	1993			4.21%	39
Qatar	1995			4.06%	40
Estonia	1992			4.01%	41
Italy	1980	0.3%	25	3.94%	42
New Zealand	1982			3.86%	43
Hungary	1990			3.85%	44
Korea, Republic of	1980	0.1%	34	3.72%	45
Kazakhstan	1997			3.45%	46
United Arab Emirates	1981			3.25%	47
Lebanon	1984			3.12%	48
Portugal	1980	0.2%	28	3.04%	49
Seychelles	1980	2.0%	11	2.72%	50
China, Macao SAR	2001			2.71%	51
Angola	1990			2.49%	52
Georgia	1999			2.34%	53
Brunei Darussalam	1992			2.26%	54
Colombia	1980	0.1%	33	2.25%	55
Slovenia	1992			2.20%	56
Mexico	1980	0.2%	27	2.15%	57
Aruba	1991			2.12%	58
Panama	2009			2.05%	59
Greece	1986			1.78%	60
Philippines	1980	0.0%	38	1.70%	61
Thailand	1980	0.0%	42	1.65%	62
Argentina	1980	1.6%	14	1.65%	63
Mauritius	1989			1.61%	64
Costa Rica	1980	0.0%	37	1.55%	65
Montenegro	2008			1.44%	66
Croatia	1992			1.36%	67
Oman	2003			1.30%	68
Poland	1981			1.27%	69
Brazil	1980	2.0%	12	1.25%	70

Belize	1984			1.25%	71
China	1981			1.24%	72
Honduras	2004			1.17%	73
Lithuania	1995			1.13%	74
Venezuela (Bolivarian Rep. of)	1980	0.0%	44	1.13%	75
Fiji	1980	0.1%	36	1.12%	76
Czech Republic	1993			1.03%	77
Turkey	1985			1.01%	78
Saudi Arabia	1980	0.0%	39	0.81%	79
Armenia	2003			0.69%	80
Serbia	2008			0.67%	81
Bulgaria	1987			0.62%	82
Slovakia	1993			0.61%	83
Botswana	1980	10.5%	2	0.58%	84
India	1980	0.0%	41	0.57%	85
Zimbabwe	1983			0.55%	86
Egypt	1980	0.1%	35	0.52%	87
Nigeria	1980	0.0%	43	0.52%	88
Viet Nam	2005			0.52%	89
Cambodia	1992			0.50%	90

*Source: Outward FDI Stock from UNCTAD; last accessed on 25 July 2018; Capital Stock was taken from the Penn World Tables 9.0; last accessed on 25 July 2018.*

## Appendix 3: US and UK: Characterization as Dominant Outward Stock Country (\*) versus Dominant Inward Country (\*\*) Versus Two-Way FDI (\*\*\*)

Benchmarking year is 2012; for some countries the assignment would differ if 2002 would be taken as benchmark)

#trade	US	FDI Inward Stock US		FDI Outward Stock US		
		1=source 2=host 3=both	2002	2012	2002	2012
1	China (*, brown)	1	385,000,000	5,154,000,000	39,889,000,000	70,190,090,000
19	Hong Kong	1	2,005,000,000	6,283,000,000	20,825,853,000	38,049,158,000
18	Singapore	1	1,530,000,000	26,244,000,000	19,855,917,000	87,834,001,000
16	Vietnam	1	0	44,000,000	181,000,000	1,064,000,000
3	Mexico	1	7,829,000,000	14,883,000,000		198,833,330,000
9	India	1	227,000,000	5,158,000,000		32,561,517,000
12	Brazil	1	923,000,000	3,590,000,000		113,439,975,000
17	Malaysia	1	336,000,000	662,000,000		15,485,829,000
13	Netherlands (**, yellow)	2	145,596,000,000	274,904,000,000	81,565,750,000	70,379,196,000
8	France	2	133,914,000,000	209,121,000,000	52,011,301,000	102,022,641,000
5	Germany	2	138,301,000,000	199,006,000,000	48,330,366,000	99,075,100,000
14	Switzerland	2	118,342,000,000	203,954,000,000	47,393,496,000	94,702,051,000
4	Japan	2	147,372,000,000	308,253,000,000	35,584,793,000	61,592,119,000
20	Belgium	2	9,777,000,000	88,697,000,000		27,989,761,000
7	United Kingdom (***, blue)	3	211,699,000,000	486,833,000,000	200,825,564,000	425,237,568,000
2	Canada	3	92,529,000,000	225,331,000,000	146,597,873,000	328,074,759,000
15	Ireland	3	27,302,000,000	24,917,000,000	33,597,186,000	15,597,952,000
10	Italy	3	6,830,000,000	23,260,000,000	15,445,246,000	15,311,062,000
6	South Korea	3	2,932,000,000	24,467,000,000	8,672,033,000	29,818,238,000
11	Taiwan	3	4,000,000	0	0	0

Note: \*If outward stock is at least double the inward stock, US is labeled as main FDI source country. \*\*If FDI Inward stock is at least twice as large as outward FDI stock, the US is labeled an FDI host country for the respective countries \*\*\*Two-way FDI. Source: UNCTAD

#trade	UK	FDI Inward Stock UK		FDI Outward Stock UK		
		1=source 2=host 3=both*	2002	2012	2002	2012
3	China (*, brown)	1	0	1,846,259,000	10,696,000,000	17,666,000,000
9	Italy	1	9,329,104,000	13,914,794,000	14,760,446,000	33,196,287,000
11	Norway	1	1,642,425,000	7,871,059,000	4,327,634,000	17,291,741,000
14	Poland	1	20,953,000	118,350,000	1,512,899,000	9,946,058,000
16	Sweden	1	6,856,601,000	12,347,841,000	16,203,966,000	46,275,655,000
18	India	1	0	3,263,302,000		35,595,219,000
19	South Korea	1	722,087,000	4,094,907,000	1,077,660,000	15,129,399,000
8	Ireland	1	7,324,024,000	22,016,241,000	31,973,799,000	46,014,091,000
12	Canada	1	14,051,681,000	23,475,890,000	17,442,390,000	54,863,344,000
4	Netherlands (**, yellow)	2	63,685,480,000	227,397,533,000	55,961,752,000	70,321,934,000
7	Switzerland	2	15,661,870,000	54,240,556,000	5,638,592,000	13,307,877,000
15	Japan	2	19,004,745,000	65,660,535,000	2,683,104,000	15,429,701,000
1	Germany (***, blue)	3	60,824,533,000	102,847,657,000	30,173,182,000	74,928,752,000
2	United States	3	200,825,564,000	425,237,568,000	211,699,000,000	486,833,000,000
5	France	3	59,950,937,000	123,789,280,000	63,363,473,000	115,484,484,000
6	Belgium	3	2,844,829,000	50,912,557,000		32,358,296,000
10	Spain	3	3,711,978,000	66,201,788,000	46,940,839,000	61,885,159,000
13	Hong Kong	3		16,613,173,000	6,424,724,000	16,734,404,000
17	Turkey				2,150,000,000	12,876,000,000
20	United Arab Emirates					

Note: \*If outward stock is at least double the inward stock, US is labeled as main FDI source country. \*\*If FDI Inward stock is at least twice as large as outward FDI stock, the US is labeled an FDI host country for the respective countries \*\*\*Two-way FDI. Source: UNCTAD



## References

- AIELLO, F.; BONNANO, G.; VIA, A. (2015), New Evidence on Export Price Elasticities from China and Six OECD Countries, *China & World Economy*, Vol. 23, 56-78. <https://doi.org/10.1111/cwe.12136>
- COUNCIL OF ECONOMIC ADVISERS (2018), Economic Report of the President, February 2018, available at [https://www.whitehouse.gov/wp-content/uploads/2018/02/ERP\\_2018\\_Final-FINAL.pdf](https://www.whitehouse.gov/wp-content/uploads/2018/02/ERP_2018_Final-FINAL.pdf) last accessed 18.07.18
- DEUTSCHE BUNDESBANK (1998), Effects of Exchange Rates on German Foreign Trade, Monthly Report, January, 50-58.
- FROOT, K.; STEIN, J. (1991), Exchange Rates and Foreign Direct Investments, *Quarterly Journal of Economics*, 1191-1217.
- IMF (2006), Exchange Rates and Trade Balance Adjustment in Emerging Market Economies, Washington DC.
- KAPPLER, M. ET AL. (2013), The Macroeconomic Effects of Large Exchange Rate Appreciations, *Open Economies Review*, Vol. 24, 471-494. <https://doi.org/10.1007/s11079-012-9246-4>
- KOHLI, U. (2004), Real GDP, real domestic income, and terms-of-trade changes, *Journal of International Economics*, 62, 83-106. <https://doi.org/10.1016/j.jinteco.2003.07.002>
- OECD (2018), FDI in Figures, April 2018, OECD Publishing: Paris <http://www.oecd.org/corporate/FDI-in-Figures-April-2018.pdf>
- WELFENS, P.J.J. (2011), *Innovations in Macroeconomics*, 3rd revised and enlarged edition, Heidelberg and New York: Springer.
- WELFENS, P.J.J. (2012), Marshall-Lerner Condition and Economic Globalization, *International Economics and Economic Policy*, Vol. 9, 191-207. <https://doi.org/10.1007/s10368-010-0177-5>
- WELFENS, P.J.J. (2017), *An Accidental BREXIT*, Palgrave Macmillan: London; 2nd edition 2019.

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