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Does trade support global output growth? Further evidence on the global trade – global output connection

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Abstract

Using the standard tools of time series econometrics, this paper suggests that rising international trade may not have been supporting global economic growth (while growing global output seems to have supported growing global trade). Large and persistent trade imbalances, typical since the mid-1970s, are just one possible reason for trade no longer playing the positive role assigned to it in the mainstream trade theories. The second reason relates to the 'race-to-the-bottom' tendencies with respect to the wage rates which have developed under globalization.

Keywords: world income, world trade, globalization, wage-led growth, VEC

JEL: F43, F15, F16, O47, O49

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1 Introduction

For many decades now international trade has been gaining in importance. The share of global exports (of goods and non-factor services) in global GDP, which stood at less than 12 percent in the early 1960s, climbed to over 32 percent in 2008 before falling – during the 2009 global crisis – below the 30 percent mark. Since then the share has been rather stable at close to 30 percent (see Figure 1).

Many explanations have been put forward to account for the long-run tendency of the trade share to rise. The phenomenon of world trade growing faster than world GDP can be seen as reflecting the progressing liberalization of international trade (and of international flows of capital) as well as the continuing advances in transport and communication technologies. Technological progress combined with the tendencies to liberalize internationally (and internally) are jointly responsible for the development of internationalized forms of production organization, the rising importance of production fragmentation, outsourcing etc. The ongoing internationalization of production inflates the values of international trade relative to final output (see for example Krugman 1995; Baier, Bergstrand 2001).

Under the standard assumptions of the neoclassical (and classical) trade theory, liberalization of trade and reduced trade costs should be conducive not only to 'more trade', but to more gains from trade – additional net output accruing to countries participating in trade (and thus to greater global output). "Free trade – given the usual assumptions – necessarily makes available to the community as a whole a greater physical real income in the form of more of all commodities."[1]

The 'new' theories of international trade and the new 'new' trade theories generally support the view that more trade should generate more output to the participating parties. However, academic opinions openly doubting the benefits to individual nations of freer trade (often hinting at the advantages of some levels of protectionism) are not so rare, especially among students of developing countries (for example Bhagwati 1958; Stiglitz 2001; Thirlwall, Pacheco-Lopez 2008). Interestingly, the 'Pope' of neoclassical trade theory himself expressed some heretical doubts about the doctrine he had long preached (Samuelson, 2004). On the other hand, there has been no shortage of academic contributions defending the view that 'trade drives growth' (for example Frankel, Romer 1999; Frankel 2008). That view has become common wisdom and may have been providing rationale for liberalization (external, across the world as well as internal – in leading market economies) progressing, stepwise, since 1973.[2]

Are the conventional views on the positive role of free trade supported by empirical evidence? There are numerous studies concerned with the evaluation of the role of trade for individual countries, or panels of countries. However, the rich empirical literature on growth accounting is not unanimously supportive of the hypothesis endowing rising foreign trade with growth-enhancing abilities at the national level. From the empirical viewpoint the general case for the trade drives growth thesis is rather weak at the national level.[3] This may not be a coincidence. Growth in some countries may indeed have

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1 Viner (1937), quoted by Samuelson (1939).

2 In 1973 the Bretton Woods accords (which stipulated restrictions on private capital flows, fixed exchange rates and limited national trade deficits) were finally terminated.

3 A comprehensive survey by Lewer and Van der Berg (2003) of over 100 studies concerned with the growth-trade connection did not come to a definitive conclusion. A later study by the same authors (Lewer, Van der Berg 2007) is also inconclusive. As documented by Hillebrand, Lewer and Turtora Zagardo (2010, p. 1), "... there is a troubling disconnect between the economic growth literature and the trade literature". For example, Rodrik, Subramanian and Trebbi (2004, p. 131) state that "... once institutions are controlled for, trade is almost always insignificant, and often enters the income equations with the 'wrong' (i.e. negative) sign ...".

been driven by their rising exports. But at the same time that same trade may have impeded growth in other (e.g. net importing) countries. Given the conflicting evidence on the trade-output links at the national level it may be impossible to draw, from that evidence, any definitive conclusions concerning the links between the developments in aggregate output and aggregate trade. To be able to assess the global consequence of trade expansion it is necessary to study the developments in global aggregates: global trade and global output (Podkaminer 2014, 2016).

It is an irony that the tremendous expansion of international trade of the world economy does not seem to have been associated with an acceleration of world output growth. Actually, growth in per capita Gross Global Product has weakened secularly – while its volatility has been increasing – since the early 1970s (see Figure 2).

The secular global growth slowdown could be attributed to some 'exogenous' developments. However, it seems rather unlikely that the global growth slowdown reflects technological stagnation of some sort. If anything, the last 50 years have witnessed an unprecedented wave of applied technological innovation which has been coupled with an equally impressive global upgrading of 'human capital'. Also, the growth slowdown cannot be attributed to, for example, intensified shortages of exhaustible resources (such as energy carriers), or of the labour force. In fact, since the early 1980s unemployment has become high and persistent – at least in the OECD countries (see for example Nickell, Nunziata, Ochel 2005) while the continuing secular decline in commodities' terms of trade indicate that resources are becoming less scarce, not more (see for example Mollick et al. 2008). The secular output growth stagnation cannot be blamed on the secularly weakening pace of labour productivity growth either (see Podkaminer 2017a; Gabrisch 2019).

As the unfavourable supply-side developments are unlikely to have been responsible for the weakening speed of global output growth, one may consider other developments, of which the progressing liberalization – and the resulting expansion of international trade itself – seems the most essential.

Section 2 offers econometric evidence strongly suggesting that expanding trade may have actually slowed down global output growth, instead of supporting it. Section 3 rationalizes the unorthodox conclusions reached in Section 2. It points out the negative – but inevitable – side effects of trade expanding under conditions of progressing liberalization (of trade and capital flows). Section 3 concludes on the need for a radical overhaul of international economic relations.

2 The econometric evidence

2.1 The data

This note reports the outcomes of an analysis of links between global output and global trade, the latter represented by global exports of goods and non-factor services.

A two-variable model to explain global growth (and global trade) may seem too 'ascetic', neglecting many possible factors having a bearing on the two items of interest. Indeed, thousands of papers have been written reporting research dealing primarily with panels of countries. This research tends to allow for large (or very large) sets of possible (or less so) factors to explain growth nationally. It may seem that a similar approach should be followed here. The permanent trouble with all that gargantuan

growth-accounting literature is that its primary conclusion is that… 'Nothing is Robust' (as claimed already by Levine and Renelt (1992)). This conclusion is not really undermined by Sala-I-Martin (1997; 2000) who 'ran millions of regressions' to select 21 variables suspected of being correlated with growth at the national level. We are to believe that religious denomination is a very important variable correlated with growth – together with elusive items such as, for example, 'political rights'. In the end, the approach admitting a possibly large number of factors suspected of having a role does not really succeed in explaining growth even nationally – and certainly would not explain the global growth. Interestingly, trade emerges as a poor explanatory variable (and may have a 'wrong', i.e. negative, sign, as noticed above) in many of these models. There is no reason to suppose that a model allowing for 'all' plausible variables (in addition to trade) would fare any better in explaining global growth. We may observe that many usual variables considered in the panel, or national, contexts would be impossible to operationalize in the global context.[4]

The two time series of interest, covering the years 1960–2018, are taken from the World Bank's World Development Indicators (WDI). Both WDI items are expressed in current US dollars. Of course it would be desirable to work with volumes rather than nominal values. But the calculation of volumes would require deeper studies on meaningful price deflators, especially for the world exports (see for example Feenstra 1994). This is still a task for the future.

The analysis works with the natural logarithms of global output and global exports. These logarithms are denoted Y and X respectively. Y and X are nonstationary (have unit roots) but their first differences, $D(Y)$ and $D(X)$ are stationary.[5]

Both output and exports were perturbed by major 'shocks' coinciding with the discontinuation of the Bretton Woods arrangements (1973) and major global recessions (1982 and 2009).

2.2 The Granger non-causality tests

The Granger non-causality tests strongly suggest that there has been a two-way 'causality' between the growth rates of exports and output, $D(X)$ and $D(Y)$. It appears that the hypothesis on the (short--term) Granger non-causality running from $D(Y)$ to $D(X)$ is rejected (its testing probability is less than 0.0002). The hypothesis on Granger non-causality running from $D(X)$ to $D(Y)$ is also conventionally rejected (however with a much larger P-value of 0.0122). In other words, $D(X)$ is affected by the lagged $D(Y)$, while $D(Y)$ is also affected by the lagged $D(X)$. The scale and direction of the above links are not determined by the Granger non-causality tests directly.

Testing Granger non-causality with respect to the levels X and Y (which are non-stationary) requires the application of a more complex approach (Toda, Yamamoto 1995). It appears that the hypothesis on Granger non-causality running from X to Y cannot be rejected (its P value is 0.1607). In other words, global exports are a very poor 'leading indicator' for global output. However, the hypothesis on Granger non-causality running from Y to X is rejected at the 1 percent level (actually $P = 0.0002$). Global output turns out to be a very good 'leading indicator' for global exports.

[4] 'The Truth' – if it is to be of any importance – must be achieved through means as parsimonious as possible. It is no good to 'explain' quite straightforward things by models with dozens of ad-hoc variables. Such models tend to obscure rather that reveal plain truths (which may be the reason why thousands of papers written 'to explain growth' eventually explain next to nothing!).

[5] The detailed testing (unit root) statistics are available from the author, on request.

2.3 The Vector Error Correction (VEC) model

Because of the presence of Granger causality (above) the non-stationary series X and Y may be co-integrated (i.e. be bound to each other in a sort of long-term 'equilibrium' relationship). Indeed, upon the application of proper econometric means, starting with the so-called Johansen procedure, this turns out to be the case (see the upper panel in Table 1).[6] The co-integrating (or long-run equilibrium) relationship tying up X to Y is estimated to have the following form[7] (see the upper panel in Table 1):

$$Y_t - 0.751 \cdot X_t + 8.79$$

According to the above formula, rising exports are expected to be correlated with rising output (and vice versa, of course). But the formula itself is mute about the direction and strength of "causality". The expression ($Yt - 0.751 \cdot Xt - 8.79$) measures a 'disequilibrium', or 'error' obtaining in year t. That 'error' will be partly corrected the next year – through the increments $D(X)$ and $D(Y)$ to X and Y respectively.

The 'error correction' (middle) panel in Table 1 characterizes the short-run dynamics of the system consisting of the two "incremental" variables: $D(X)$ and $D(Y)$. The dynamics involves (i) the adjustments to equilibrium when X and Y happen to lie outside the momentary equilibrium position and, (ii) the recent history of both variables (in the case considered the lagged increments $D(X(-1))$ and $D(Y(-1))$.

The interesting thing about the short-term dynamics of the system (i.e. the error correction mechanism) is that the regression coefficients for the lagged increments of exports, $D(X(-1))$, are negative, while the regression coefficients for the lagged increments of output, $D(Y(-1))$, are positive. This suggests that positive increments to exports are likely to have negative consequences for the (near) future increments in both exports and output, while positive increments in output are likely to contribute positively to the increments to both exports and output in the near future. We also observe that in absolute terms the regression coefficients for $D(Y(-1))$ are much larger (and statistically more significant) than the regression coefficients for $D(X(-1))$. In absolute terms the increments in output have stronger effects on the short-term dynamics of the system than the increments in exports.

2.4 The VAR model

According to Table 1 a positive 'disequilibrium' ($CointEqt > 0$), i.e. when $Yt - 0.751 \cdot Xt + 8.79$, is partly corrected by reducing the next year's $D(Yt+1)$) – and thus also $Yt + 1$ – by $0.09 \cdot CointEqt$. The correction process appears to be rather slow. Moreover, the pace of disequilibrium correction is additionally slowed down because, simultaneously, $Xt+1$ is moved away from the momentary equilibrium – by lowering it by $0.01 \cdot CointEq_t$. The dis-equilibrating force acting on $D(X)$ is much (about twice) weaker than the equilibrating force acting on $D(Y)$ (and it is also statistically nonsignificant). (When $CointEqt > 0$,

[6] Johansen's trace and max eigenvalue tests reject cointergation for lag numbers higher than one and favour the second option ('intercept and no trend in the cointegrating equation'). The serial correlation of the residuals to the model in Table 1 is rejected, as well as their heteroskedasticity. The detailed testing statistics are available from the author, on request.

[7] The long-run equilibrium relationship can be written, equivalently, as ($Xt = 1.331 \cdot Yt - 11.70$). The estimated long-term elasticity of the exports' value with respect to the value of global output is 1.331.

the above adjustments work in the opposite directions). In any case, because the corrective response to disequilibrium turns out to be very weak, it may be useful to model the movements in $D(Y)$ and $D(X)$ abstracting from the responses to disequilibrium which can be done by means of the standard vector autoregression (VAR) analysis.

Table 2 reports the VAR model involving $D(Y)$ and $D(X)$ as endogenous variables (and the constant as well as the three time dummy variables as exogenous variables). The model in Table 2 was selected upon the application of the usual statistical tests and criteria.[8]

As can be seen, the VAR regression coefficients for the lagged increments $D(Y(-1))$ and $D(X(-1))$ are numerically quite close to the respective VEC coefficients. The VAR coefficients for the lagged $D(X)$ are negative and positive for the lagged $D(Y)$.

Concluding, the standard VEC and VAR analyses involving global exports and global output do not support the hypothesis that 'trade drives global output growth'. While the logs of global output and global exports are 'co-integrated' (i.e. in the long run are, figuratively speaking, correlated), output (and output growth) appears to have been the positive force behind exports, while exports (and export growth) have actually tended to obstruct output growth.

3 How could trade expansion have contributed to the global growth slowdown? Some hypothetical explanations[9]

The phenomenal rise in international trade has been the most obvious effect of globalization. According to the classical, neoclassical and contemporary theories of international trade, 'more trade' (and especially more free trade) should bring output gains.[10]

Why are such positive effects not revealed by our analysis of long-run data on global exports and global output? There may be two major reasons.

Firstly, it may be argued that rising world trade could have been productive on the global scale if growth in individual countries had been, at least approximately, externally balanced most of the time – and not only sporadically, in response to severe payments or exchange rate crises. However, globalization appears to have produced high levels of trade imbalances. As can be seen (Figure 3) the (positive) trade surpluses summed up across the world were low in relation to global output until the late 1960s, i.e. during the years of the Bretton Woods regime, characterized by restricted private capital flows and a rather illiberal approach to foreign trade. From the early 1970s through the early 1990s –

[8] The optimal lag length for VAR is 1. The serial correlation of the residuals to the model in Table 2 is rejected, as well as their heteroskedasticity and the model is stable (neither of the roots of its characteristic polynomial lies outside the unit circle). The detailed testing statistics are available from the author, on request.

[9] Podkaminer (2019), offers a more extensive discussion of the demand-side developments jointly responsible for the on--going long-term (secular) global stagnation. Liberalization (starting with trade) plays the central role there.

[10] Classical and neoclassical models which yield theorems on comparative advantages (which substantiate the claims on the advantages of free trade) are commonly called 'trade theories'. This is a misnomer. The proper name for these theories should be 'models of barter exchange'. In these models individual countries exchange ('trade') goods – with no money being involved. Barter exchange must be balanced by definition. For each participating country the value of exports must equal the value of imports (with indeterminate price level and yet the price structure corresponding to the 'exchange equilibrium'). The conclusions on the Pareto optimality of the free barter exchange must not be mechanically applied to the analyses of real-life trade. In reality, exporters may (and do) aim at working out money surpluses desired for their own sake (and not as a means needed for financing the necessary imports). Real-life trade may (and very often does) produce persistent national trade surpluses (and deficits) expressed in terms of money (or external debt).

under progressing external (and internal) liberalizations across much of the globe – the levels of global trade imbalances were much higher than before. Also these imbalances were much more unstable (in part due to periodical indebtedness crisis developing, under the liberalization of capital flows, e.g. in Latin America). The era of triumphant globalization (since the early 1990s) saw an exponential rise in international trade imbalances – climaxing in the great recession in 2009. It is worth noticing that global output growth was high and fairly stable under the low and stable global trade imbalances (see Figure 2). With the trade imbalances swelling since the early 1970s, global output growth has become increasingly unstable – and much weaker, on average. The link between unstable/weak output growth and the rising significance of external trade imbalances may not be incidental. Large/rising trade imbalances, sustained for longer periods by capital flows increasingly divorced from real economic fundamentals, may have acted as brakes on sustained output growth in both the persistent deficit and the persistent surplus countries.[11]

Under a different international economic order, enforcing more balanced trade among nations – with major nations not allowed to compensate deficient domestic demand with huge trade surpluses that destabilize their partners – global trade may assume the positive role assigned to it by the 'trade' theory.

Secondly, the expanding internationalization of production[12] (which has been made possible by the liberalization of trade and capital flows) seems to be generating, or at least supporting, the tendency for wage shares to decline fairly universally – and thus for profit shares to rise throughout the world (Figure 4). The freedom to relocate production to low-wage (and low-tax) countries (such as Poland, Mexico etc.) triggers off unsound competition among countries. They try to outdo one another by lowering the tax rates (on foreign business in particular), the statutory wage rates and by dismantling 'privileges enjoyed by labour'. A race to the bottom is the result of this competition.

It is very difficult to break out of the race-to-the-bottom. A country insufficiently 'attractive' on wages and business taxation risks being boycotted by international corporations (and own national firms which are also induced to move to cheaper destinations). The 'barge economy' triumphs (see for example Palley 2009).

The trade-driven shift in income distribution from wages to profits can account for the weakening of global growth, because such a shift raises the overall saving propensity – without necessarily raising the propensity to invest. The tendency for the slowdown of growth of global output could then be an end effect of both developments: rising global profit share/profitability and falling propensity to invest. In terms of the Bhaduri and Marglin (1990) classification, global output growth would have to be characterized as "wage-led" rather than "profit-led".

4 Concluding remarks

Since the early 1970s global trade has been rising very fast. However, the output growth accompanying the expansion of trade has become weak and unstable. Our analysis of the available (i.e. post-1960) data suggests that the accelerated growth of global trade may have obstructed the global output growth – rather than 'driving' it as it is generally believed.

[11] That the globally imbalanced international trade has to reduce global output can be proven 'formally' (Podkaminer 2017b).

[12] Feenstra (1998) characterizes the process as 'integration of trade and disintegration of production in the global economy'.

There are good economic reasons why rising trade has failed to support faster and more stable global output growth. Under progressing external (and internal) liberalization (involving free capital movements) international trade no longer boils down to mutually beneficial barter exchange of 'cloth' against 'wine'. Under globalization large and persistent trade imbalances become the norm – and so do the periodical build-ups of destructive foreign debts. At the same time free trade forces individual countries into the 'race-to-the bottom' on wages and business taxes. This brings about falling wage shares throughout the world, while failing to promote faster capital formation. In the end effect, expanding trade appears to be suppressing aggregate demand globally.

This sorry state of affairs is unlikely to change as long as the presently prevailing economic axioms rule supreme. Unfortunately, the much-needed changes are unlikely to materialize anytime soon.

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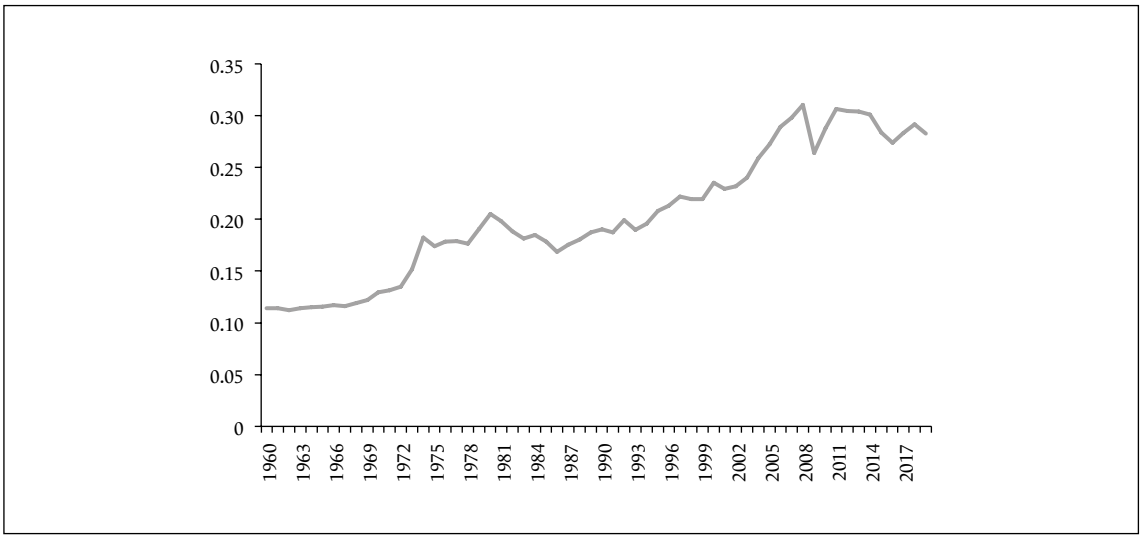
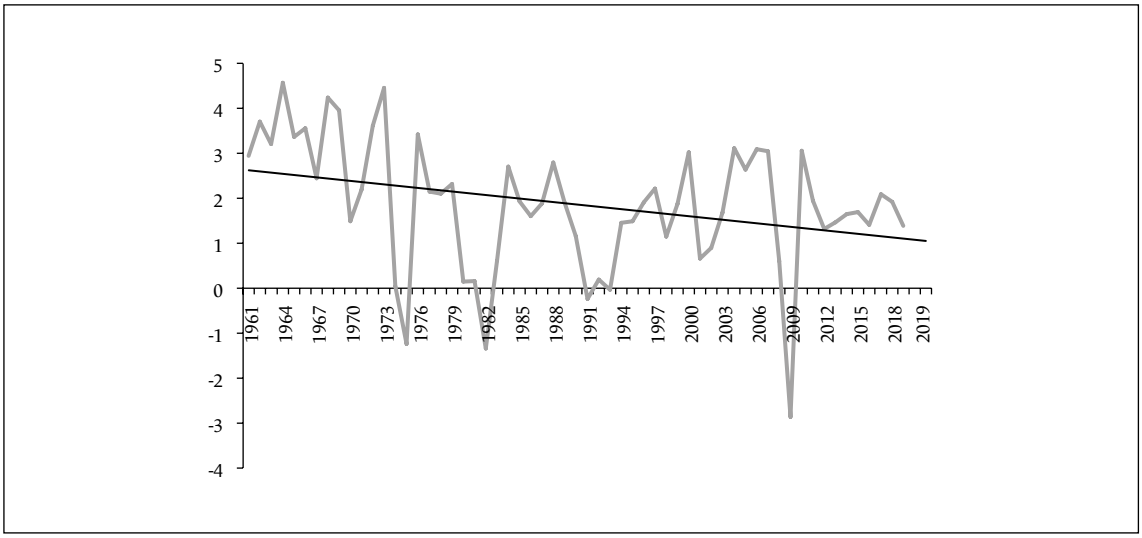
Appendix

Figure 1
Share of global exports in global output since 1960



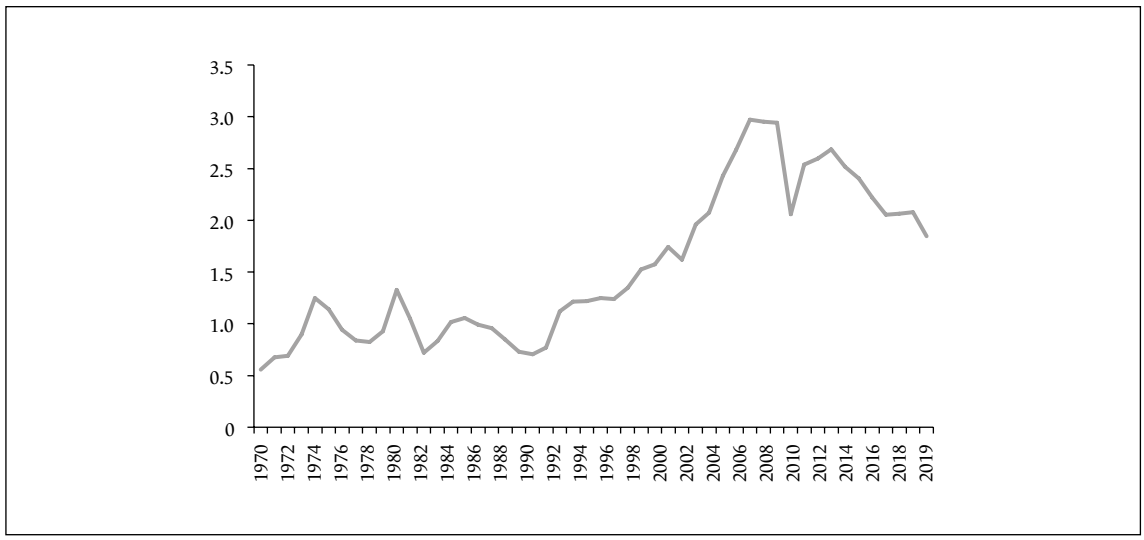
Source: World Development Indicators (October 2020).

Figure 2
Growth rate (percent) of real per capita Gross Global Product, 1961–2019



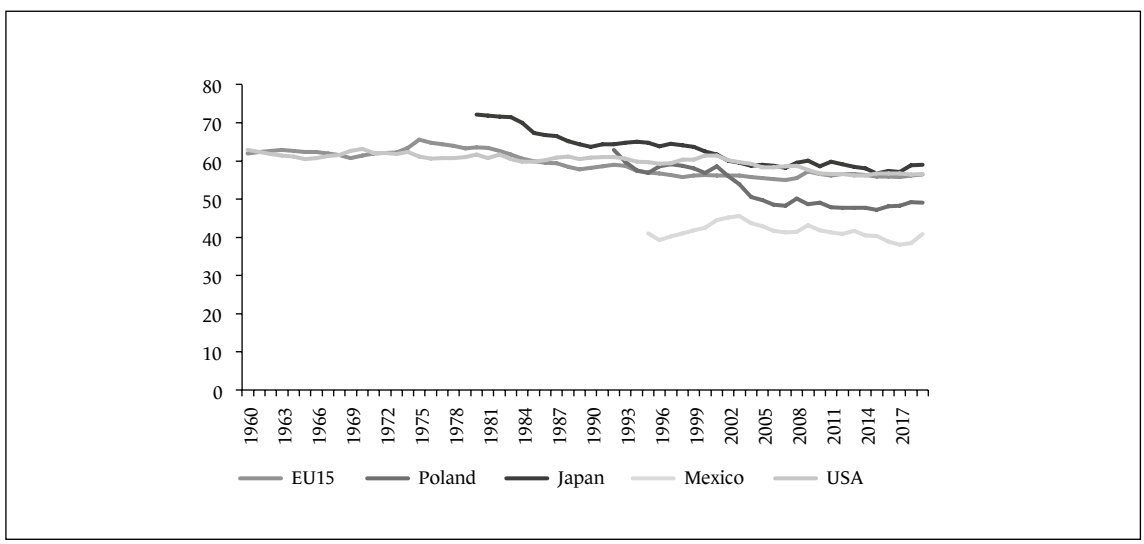
Source: World Development Indicators (October 2020).

Figure 3
Ratio (percent) of the sum of national trade surpluses to global output (1970–2019)



Source: own calculations based on WDI (July 2019).

Figure 4
GDP shares (adjusted) of wages (percent) for Western Europe (EU15), USA, Japan, Mexico and Poland (1960–2019)



Source: AMECO (October 2020).

Table 1
Vector error correction estimates

Cointegrating Eq:	**Cointegrating Eq1**		
Y(-1)	1.000000		
X(-1)	-0.751163 (0.02189) [-34.3218]		
C	-8.789871		
Error correction	**D(Y)**	**D(X)**	
*CointEq*1	-0.090301 (0.05155) [-1.75170]	0.010193 (0.08628) [0.11813]	
D(*Y*(-1))	0.901785 (0.21294) [4.23494]	1.599759 (0.35640) [4.48860]	
D(*X*(-1))	-0.308371 (0.11988) [-2.57232]	-0.517286 (0.20065) [-2.57807]	
C	0.035999 (0.00936) [3.84575]	0.022930 (0.01567) [1.46354]	
R-squared	0.552654		0.587331
Adj. R-squared	0.500025		0.538782
Sum sq. resids	0.071844		0.201263
S.E. equation	0.037533		0.062820
F-statistic	10.50096		12.09763
Log likelihood	111.8189		81.94550
Akaike AIC	-3.614445		-2.584328
Schwarz SC	-3.365771		-2.335653
Mean dependent	0.071028		0.086642
S.D. dependent	0.053081		0.092501
Determinant resid covariance (dof adj.)			1.97E-06
Determinant resid covariance			1.52E-06
Log likelihood			223.8404
Akaike information criterion			-7.166912
Schwarz criterion			-6.598514

Notes:
Date: 10 February 2020; time: 09:51; sample (adjusted): 1962–2019; included observations: 58 after adjustments. Standard errors in ( ) and t-statistics in [ ]. For brevity the regression coefficients for the time dummies for 1973, 1982 and 2009 (all statistically significant) are not reported.

Table 2
Vector autoregression estimates

D(*Y*(-1))	0.969114 (0.21357) [4.53775]	1.592159 (0.34721) [4.58556]
D(*X*(-1))	-0.306511 (0.12224) [-2.50751]	-0.517496 (0.19873) [-2.60402]
C	0.030819 (0.00906) [3.40303]	0.023515 (0.01472) [1.59711]
R-squared	0.525739	0.587218
Adj. R-squared	0.480137	0.547528
Sum sq. resids	0.076167	0.201318
S.E. equation	0.038272	0.062221
F-statistic	11.52887	14.79491
Log likelihood	110.1246	81.93756
Akaike AIC	-3.590502	-2.618537
Schwarz SC	-3.377353	-2.405387
Mean dependent	0.071028	0.086642
S.D. dependent	0.053081	0.092501
Determinant resid covariance (dof adj.)		2.25E-06
Determinant resid covariance		1.81E-06
Log likelihood		218.8227
Akaike information criterion		-7.131818
Schwarz criterion		-6.705519

Notes:
Date: 10 February 2020; time: 10:15; sample (adjusted): 1962–2019; included observations: 58 after adjustments; standard errors in ( ), and t-statistics in [ ]. For brevity the regression coefficients for the time dummies for 1973, 1982 and 2009 (all statistically significant) are not reported.