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Would a Growth Slowdown in Emerging Markets Spill Over to High-income Countries?

A QUANTITATIVE ASSESSMENT

Patrice Ollivaud, Elena Rusticelli, Cyrille Schwellnus

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WOULD A GROWTH SLOWDOWN IN EMERGING MARKETS SPILL OVER TO HIGH-INCOME COUNTRIES? A QUANTITATIVE ASSESSMENT

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ABSTRACT/RÉSUMÉ

Would a growth slowdown in emerging markets spill over to high-income countries? A quantitative assessment

Growth in emerging market economies (EMEs) is set to durably slow from the rates observed over 2010-12 as cyclical effects fade, potential growth declines and external financing conditions tighten. Large negative current account balances make some EMEs vulnerable to sudden reversals in capital flows while exceptionally rapid credit expansions, as those observed in Brazil, China, Poland and Turkey over the past years, may have raised financial risk. This paper assesses recent developments and vulnerabilities in EMEs and uses macroeconometric model simulations to provide quantitative estimates of spillovers to high-income countries. The results suggest that for each slowdown of 2 percentage points in EMEs, high-income countries' growth could be around ⅔ percentage points lower on average, with around ½ percentage point accounted for by trade. Experience with past EME crises suggests that this could be exacerbated by effects from exchange rates and by financial market turbulence. OECD countries which would be hit hardest include Belgium, Japan and the Netherlands, reflecting mainly strong trade linkages with EMEs.

JEL classification codes: F20; F42; F43; F47
Keywords: Growth, emerging markets, spillovers, trade

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Quelles retombées d'un ralentissement dans les pays émergents sur les pays à haut revenu ? Une évaluation quantitative

La croissance dans les économies des marchés émergents (EMEs) va se ralentir durablement par rapport à la période 2010-2012 à mesure de la disparition des effets cycliques, du déclin de la croissance potentielle et du durcissement des conditions financières externes. D'importants déficits de la balance des transactions courantes rendent certains EMEs vulnérables à des inversions soudaines des flux de capitaux tandis que des expansions rapides des crédits, comme ceux observées ces dernières années au Brésil, en Chine, Pologne et Turquie, ont pu augmenter les risques financiers. Ce papier montre les récents développements et les vulnérabilités des EMEs ; il utilise en outre des simulations d'un modèle macro-économétrique pour donner une estimation quantitative des effets sur les pays à haut revenu. Les résultats suggèrent que pour chaque ralentissement de 2 points de pourcentage des EMEs, les pays à haut revenu auraient une croissance environ ⅔ point de pourcentage plus basse en moyenne, avec à peu près ½ point de pourcentage qui viendrait du commerce. Au vu de l'expérience des EMEs avec les crises passées, cet effet pourrait être augmenté par des effets via les taux de change et des turbulences sur les marchés financiers. Les pays de l'OCDE les plus touchés seraient la Belgique, le Japon et les Pays-Bas, ce qui reflète principalement les liens commerciaux importants qu'ils ont avec les EMEs.

Codes JEL: F20; F42; F43; F47
Mots Clés: Croissance, marchés émergents, commerce international

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WOULD A GROWTH SLOWDOWN IN EMERGING MARKETS SPILL OVER TO HIGH-INCOME COUNTRIES? A QUANTITATIVE ASSESSMENT

By Patrice Ollivaud, Elena Rusticelli and Cyrille Schwellnus[§1]

1. Introduction

1. EME growth is set to durably slow from the rates observed over 2010-12 as cyclical effects fade, potential growth declines and external financing conditions tighten.[2] On current projections in *OECD Economic Outlook No. 94* (November 2013), growth in non-OECD countries is set to slow from around 6½ per cent over 2010-12 to 5 per cent over 2013-15. For a number of EMEs, there is a risk of significantly sharper slowdowns as easy financing from abroad over 2010-12 contributed to a build-up in financial vulnerabilities. In particular, large negative current account balances make some EMEs vulnerable to sudden reversals in capital flows while exceptionally rapid credit expansions, as those observed in Brazil, China, Poland and Turkey over the past years, may have raised financial crisis risk (Schularick and Taylor, 2012).

2. Non-OECD countries contributed two-thirds to global GDP growth over 2010-12, suggesting that a broad EME slowdown will have tangible spillovers to high-income countries.[3] The weight of non-OECD countries in OECD countries' exports is about one third and financial linkages between high-income countries and EMEs have increased significantly over the past decade, with holdings of EME assets amounting to up to 20% of GDP for a number of high-income countries. Financial market turbulence in EMEs may amplify growth spillovers to developed markets if it induces high-income country investors to re-assess risk assets more broadly.

3. This paper assesses current vulnerabilities of emerging market economies (EMEs) and possible spillovers from a growth slowdown to high-income countries. The main results are as follows:

- In a number of EMEs, the rebound in capital inflows over 2010-12 eased the financing of widening current account deficits and contributed to exceptionally rapid credit expansions. However, for EMEs as a whole, financial vulnerabilities remain below those on the eve of the EME crises of 1997-98.

- As cyclical effects fade, potential growth declines and external financing conditions tighten, EME growth is nonetheless set to durably slow from the rates observed over 2010-12.

- If the growth slowdown remains contained to individual EME countries that appear most vulnerable, then spillovers to most high-income economies are likely to be marginal given the relatively small shares of developed economies' exports and external assets accounted for by

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1 The authors are members of the Economics Department of the OECD. They would like to thank Jérôme Brézillon, Thomas Chalaux, Jean-Luc Schneider and Dave Turner for helpful comments and suggestions, and Ines Gomez Palacio for assistance in preparing the document. OECD Working Papers should not be reported as representing the official views of the OECD or of its member countries. The opinions expressed and arguments employed in this paper are those of the authors.

2. The EMEs explicitly considered in most of the descriptive statistics in this paper are: Brazil, Chile, China, India, Indonesia, Mexico, Poland, Russian Federation, South Africa and Turkey.

3. The high-income countries considered in this paper are: Belgium, Canada, France, Germany, Italy, Japan, Netherlands, Sweden, Switzerland, United Kingdom and United States.

individual EMEs. However, a more broad-based growth slowdown in all non-OECD countries (including China) risks derailing the fragile recovery in high-income economies through adverse trade, financial and confidence spillovers.

- For each slowdown in non-OECD growth of 2 percentage points, macroeconometric model simulations suggest negative spillovers to growth in high-income countries could be around ⅔ percentage points on average, with around ½ percentage point accounted for by trade. This could be exacerbated by effects from exchange rates and financial markets, although such effects are more difficult to assess. Much of this adverse effect is transmitted through adverse multiplier effects (assuming monetary policy is not able to respond to offset the initial shock) and through a reduction in demand from third countries (including other OECD countries).

- The financial spillovers to high-income countries could be larger if the risk of financial contagion among EMEs materialises. Despite large variation in domestic and external vulnerability indicators across EMEs and generally enhanced resilience compared to the past, exchange rates and bond spreads remain highly correlated, suggesting that financial cycles across EMEs remain highly synchronised.

- Macroeconometric model simulations may also understate spillovers to high-income countries because tail risks such as failures of highly leveraged financial institutions are not accounted for. Past experience with EME crises suggests that even small losses for highly-leveraged hedge funds or undercapitalised banks may induce financial tensions in high-income countries.

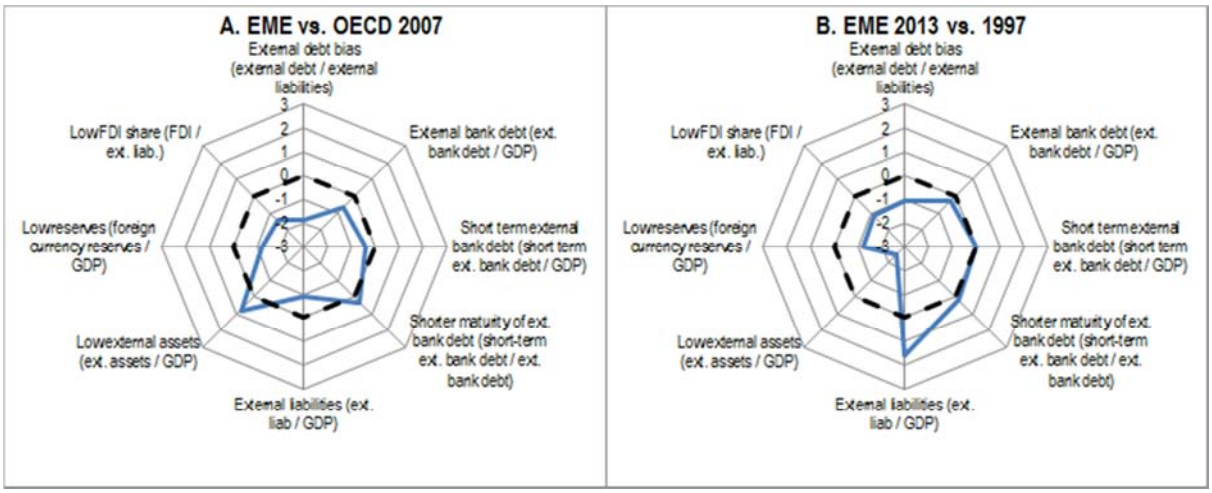
- OECD countries which would be hit hardest include Belgium, Japan and the Netherlands, reflecting mainly strong trade linkages with EMEs. For the United States, trade spillovers would be limited, but if the EME slowdown is accompanied by financial turbulence the overall effect would be similar to the OECD average.

4. The remainder of the paper is structured as follows: Section 2 briefly reviews recent developments in EMEs to assess their vulnerability to a further slowdown in growth; Section 3 assesses the trade and financial exposures of high-income countries to emerging economies with a particular emphasis on trade-in-value-added indicators; Section 4 provides illustrative quantifications of shocks to emerging markets using both the NIGEM macroeconometric model and trade-in-value-added data.

2. Recent developments and vulnerabilities in emerging markets

5. The strong recovery of EMEs over 2010-12 partly reflected sound fundamentals. On the eve of the global financial crisis of 2008-09, financial account-related vulnerabilities were on average smaller in EMEs than in OECD countries (Figure 1). In particular, FDI liabilities rather than more fickle debt liabilities accounted for a much larger share of external liabilities of EMEs and foreign currency reserves were large.

Figure 1. Financial account vulnerabilities for EMEs as a whole remain low



Note: The solid line shows standard deviations from the OECD median in 2007 (Panel A) and from the EME median in 1997 (Panel B). A value below 0 implies lower financial vulnerabilities.

Source: IMF International Financial Statistics, BIS and OECD calculations.

6. In some EMEs, the rebound in capital flows over 2010-12 was accompanied by a build-up in external vulnerabilities. Capital inflows into EMEs over 2010-12 exceeded pre-crisis levels, easing the financing of widening current account deficits in Brazil, India, Indonesia and Turkey and exposing these countries to a sudden stop in capital flows. Short-term external bank debt – which has been identified as an early warning signal of financial crises (Ahrend *et al.*, 2012) – has increased and is now at similar levels to those experienced on the eve of the EME crises of 1997-98 (Figure 2). For Brazil, China India and Russia, offshore external bond liabilities – which are mainly denominated in US dollars – have increased significantly in the wake of the crisis (BIS, 2013; Shin, 2013), raising exposure to exchange rate fluctuations and US interest rate developments (Figure 3).[4]

4. Offshore external bond issuance can be approximated by the difference between external bond issuance by nationals and external bond issuance by residents. E.g. the issuance of US dollar denominated bonds in Hong Kong by an affiliate of a Chinese corporation will be recorded as liability of a Chinese national but not as liability of a Chinese resident.

Figure 2. External vulnerabilities have surfaced in some EMEs

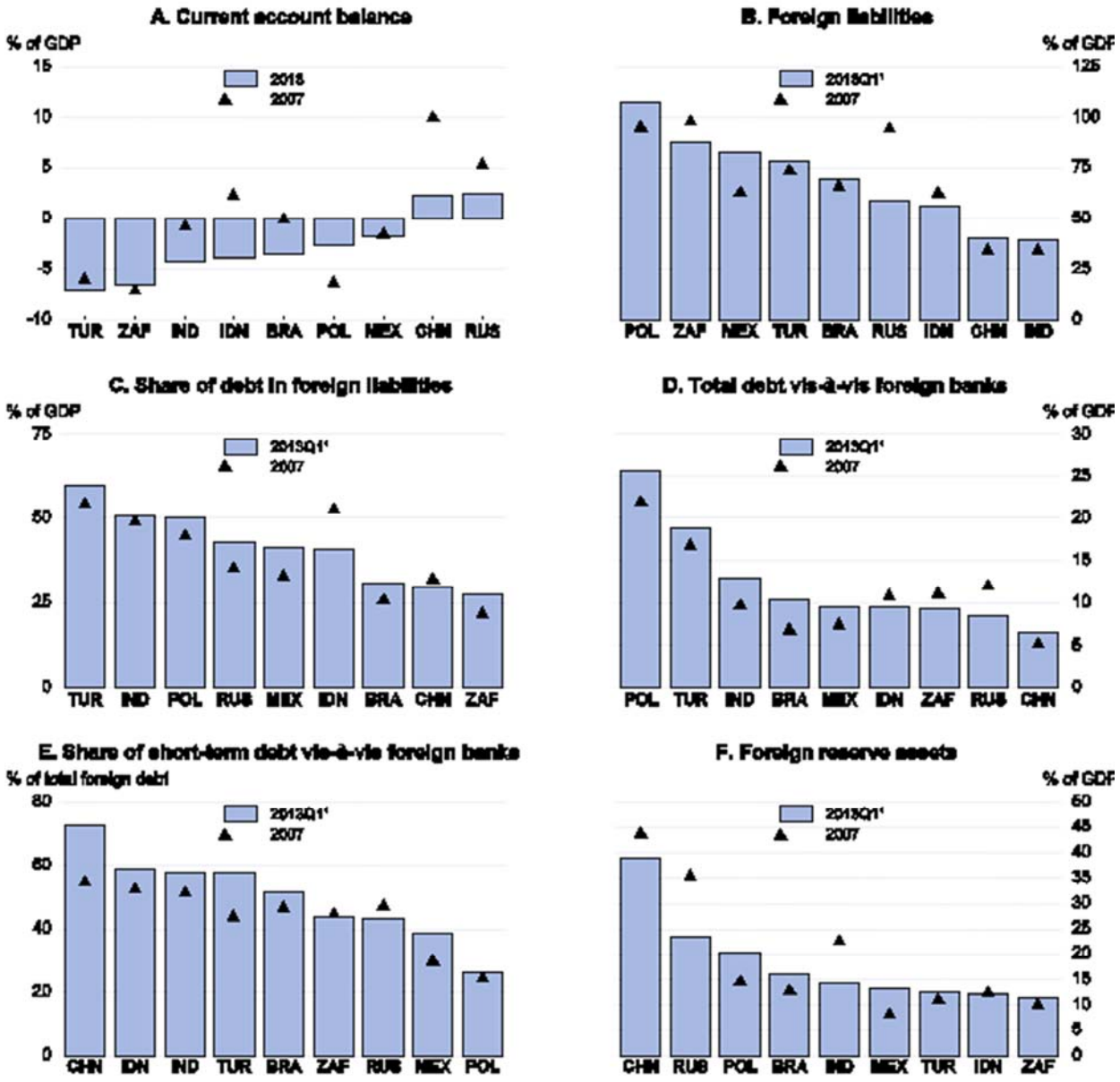
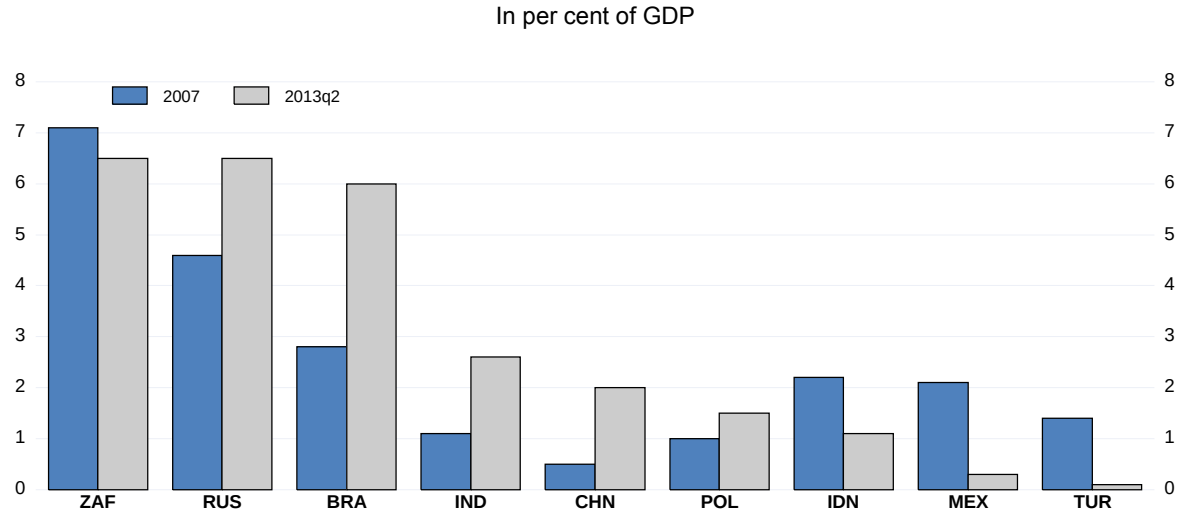


Figure 3. Offshore external bond liabilities have increased for some EMEs

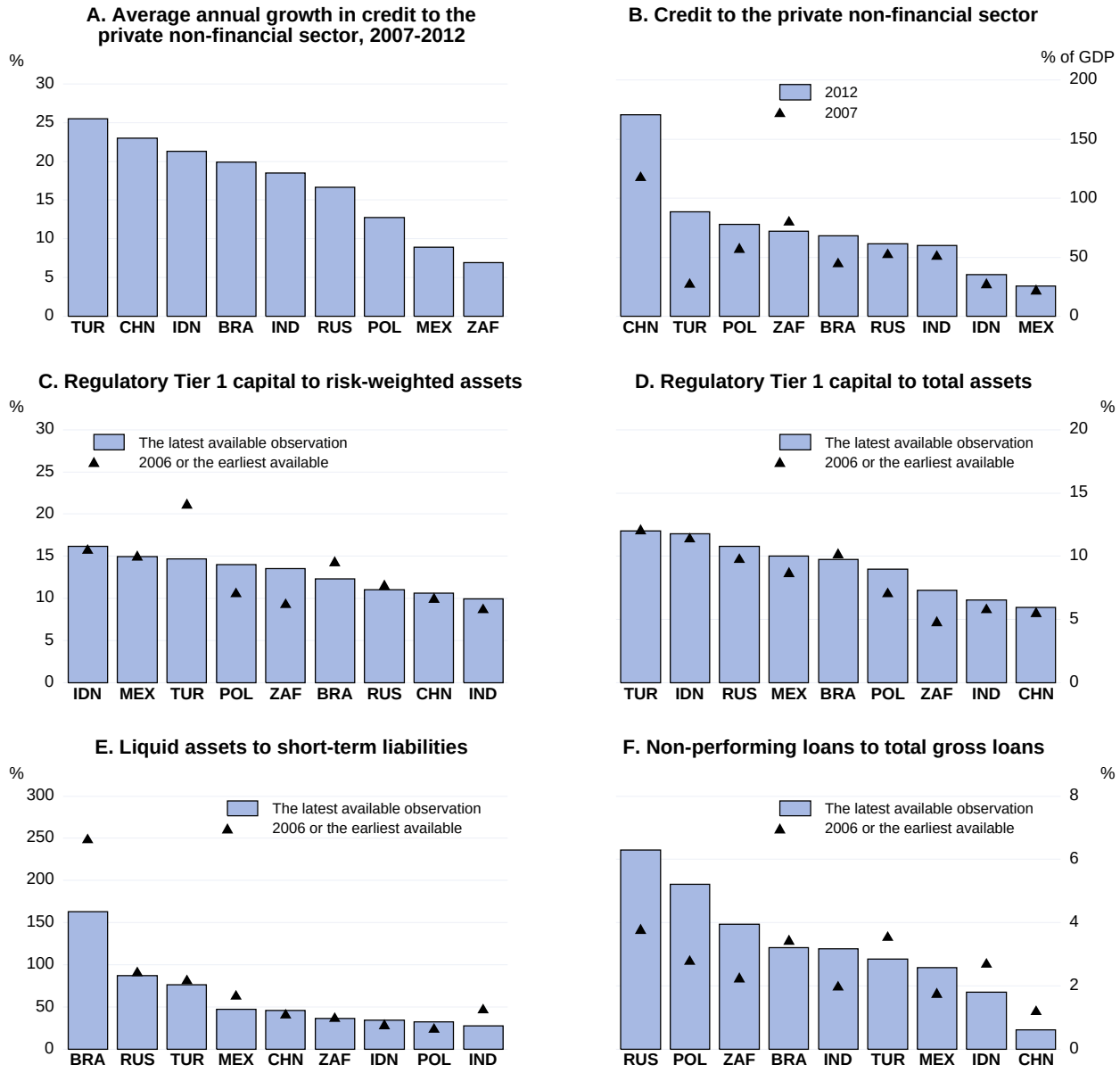


Note: Offshore liabilities are computed as the difference between debt securities based on nationality of the issuer and debt securities based on residence of the issuer.

Source: BIS, Debt securities statistics; and OECD calculations.

7. Easy external financing conditions contributed to exceptionally rapid credit expansions in a number of EMEs, with credit to the private non-financial sector growing at significantly higher rates than nominal GDP in Brazil, China, Poland and Turkey (Figure 4). Such rapid credit build-up has been identified as an early warning signal of financial crises (Schularick and Taylor, 2012), as it exposes banks to losses in case of an adverse macroeconomic shock. Non-performing loans have already increased in India, Mexico, Russia and South Africa and are likely to continue to do so if subdued economic growth persists.

Figure 4. Banking sector vulnerabilities have surfaced in some EMEs



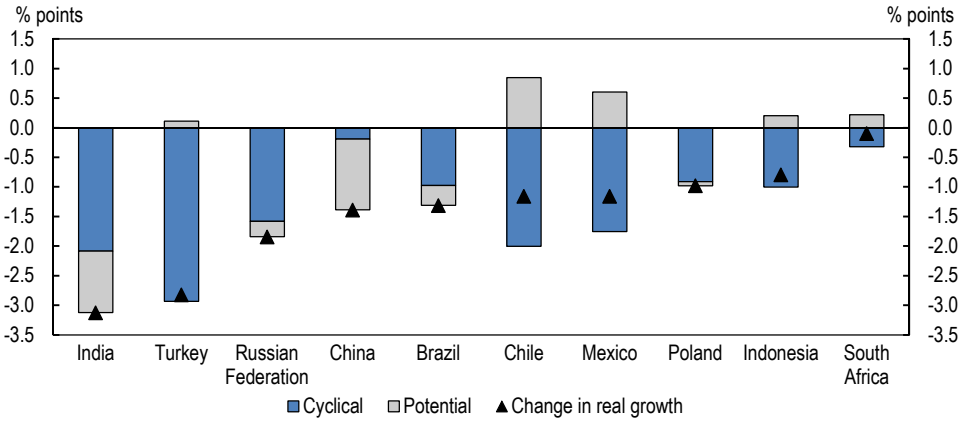
8. Particularly vulnerable EMEs include India, Indonesia, South Africa and Turkey, with projected current account deficits in 2013 of around 4% of GDP for India and Indonesia and above 7% of GDP for South Africa and Turkey. India is additionally exposed to capital flow reversals through a high share of short-term external bank debt in total bank debt.

9. Despite the build-up in domestic and external vulnerabilities in a number of individual EMEs, average financial account-related fundamentals remain stronger than on the eve of the 1997-98 EME crises (Figure 1, Panel B). In particular, EMEs' foreign currency reserves are significantly larger than in 1997 and a larger share of external liabilities is accounted for by FDI rather than portfolio or bank debt. Increases in gross external liabilities have been offset by increases in gross external assets. Current GDP projections do not build in tail risks such as disorderly current account adjustments, with projected EME

growth slowing only moderately from around 6½ per cent over 2010-12 to 5% over 2013-15 as cyclical effects fade and potential growth declines (Figure 5).

Figure 5. Growth in EMEs is projected to slow

Average 2013-15 compared to average 2010-12



Source: OECD, Economic Outlook 94 database

3. Trade and financial exposures of high-income countries to emerging economies

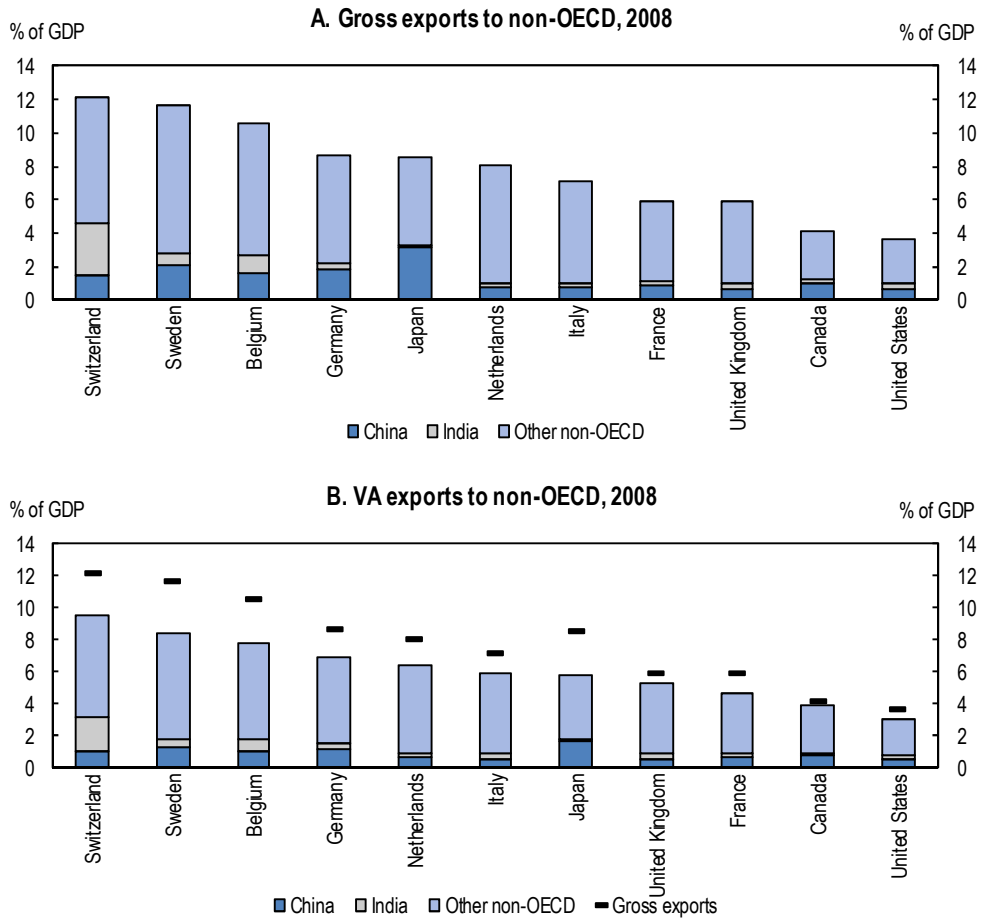
Trade exposures

10. For most high-income countries, gross exports to individual EMEs account for less than 2% of GDP (Figure 6). Even for those countries with strong trade ties with China and India, gross exports individually account for less than 3% of GDP. However, gross exports to non-OECD economies as a whole account for over 10% of GDP for a number of open high-income countries, such as Switzerland, Sweden and Belgium and 6-8% for manufacturing exporters such as Germany, Italy and Japan.[5]

11. Value-added exports of high-income countries to non-OECD countries are generally smaller than gross exports, suggesting that gross trade linkages slightly overstate direct trade exposures to EMEs. EMEs are often intermediate links in global supply chains rather than final destinations for high-income countries' exports, implying that only a part of gross exports to EMEs depends directly on EME domestic demand. This appears to be particularly true for small open economies such as Switzerland, Sweden, Belgium and the Netherlands, as well as large manufacturing exporters such as Germany and Japan.

5 . Adding the OECD EMEs Chile, Mexico, Poland and Turkey to the group of non-OECD countries would raise high-income countries' gross export-to-GDP ratios by 1-2 percentage points and value-added export-to-GDP ratios by 0.5-1 percentage point.

Figure 6. Limited trade exposure of selected OECD countries to non-OECD countries



Source: OECD-WTO Trade in Value Added database.

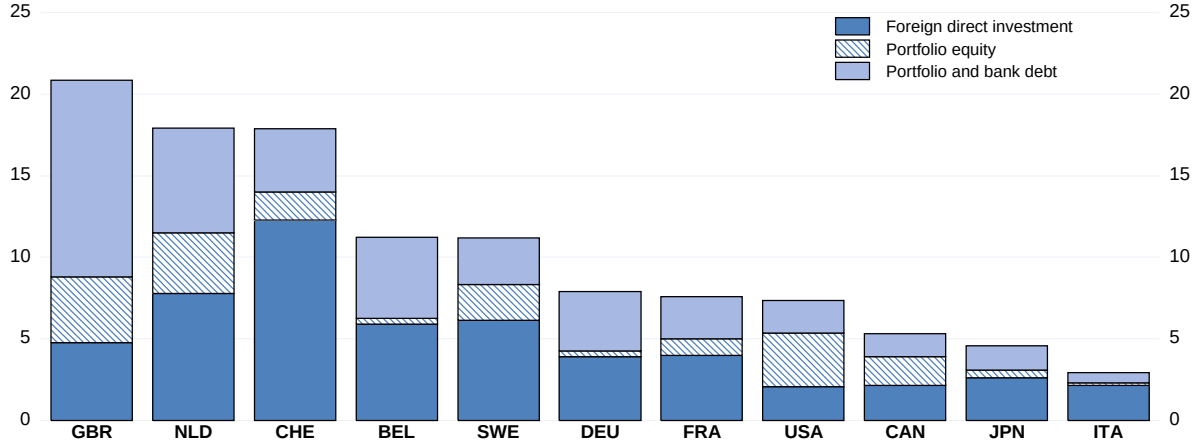
Financial exposures

12. For some high-income countries – United Kingdom, Netherlands, Switzerland, Belgium and Sweden – financial exposures to EMEs, measured in terms of gross external asset holdings, amount to more than 10% of GDP (Figure 7, Panel A).

Figure 7. Sizable exposure to EME financial assets for some OECD countries

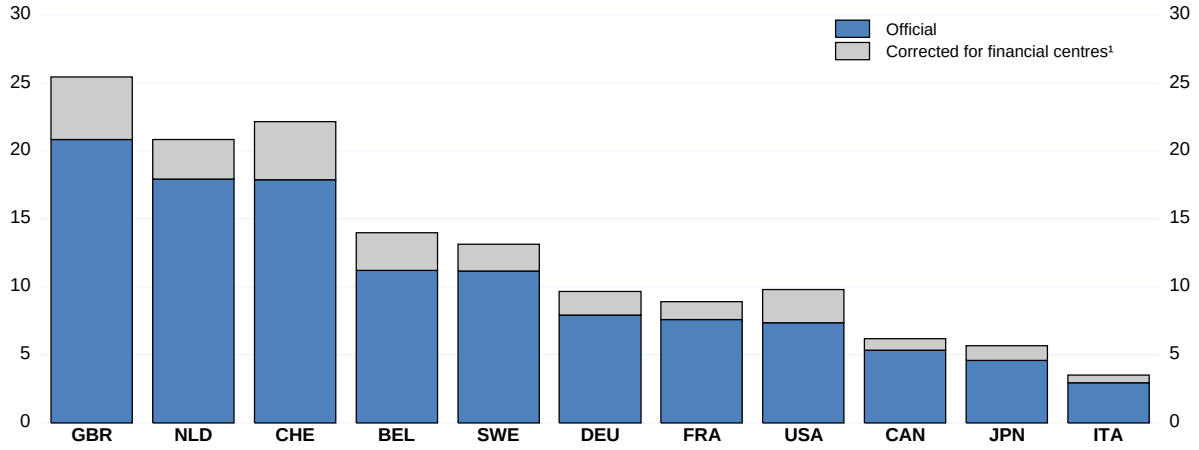
Panel A: Exposures by asset class

In per cent of GDP, 2011



Panel B: With financial centres correction

In per cent of GDP, 2011



1. Correction assumes that high-income countries allocate the same portfolio shares to EMEs when acquiring EME assets directly and when acquiring EME assets indirectly through financial centres. *E.g.* the United States holds about 2.5 trillion USD in financial centres. Given that it holds about 20% of its total external assets (excluding financial centres) in EMEs, the assumption implies that 20% of the 2.5 trillion USD holdings in financial centres are indirect holdings of EME assets. Financial centres include: Andorra, Anguilla, Antigua and Barbuda, Aruba, Bahamas, Bahrain, Barbados, Belize, Bermuda, Cayman Islands, Cyprus, Gibraltar, Grenada, Guernsey, Hong Kong, Isle of Man, Jersey, Lebanon, Liechtenstein, Luxembourg, Macao, Mauritius, Monaco, Montserrat, Nauru, Netherlands Antilles, Palau, Panama, Samoa, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Singapore, Turks and Caicos Islands, Vanuatu and Virgin Islands.

Note: 2010 data for foreign direct investment of Germany and for bank debt.

Source: OECD, Economic Outlook 94 database; OECD, Foreign Direct Investment database; IMF, Coordinated Portfolio Investment Survey; BIS; and OECD calculations.

1. Note by Turkey:

The information in this document with reference to “Cyprus” relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the “Cyprus issue”.

2. Note by all the European Union Member States of the OECD and the European Union:

The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

13. A slowdown in EMEs if accompanied by financial market turbulence may hit high-income countries with large gross exposures such as the United Kingdom, the Netherlands or Switzerland through declines in asset valuations and earnings, irrespective of currency denomination. Lower profits would directly impact portfolio and FDI equity valuations and earnings. Although interest payments on debt are not contingent on economic conditions so that creditors are in principle shielded against economic downturns, past experience with EME crises suggests that debtors may default on external liabilities in case of sharp currency depreciations or downturns in activity. If EME debt is mainly held by highly leveraged financial institutions or under-capitalised banks in high-income countries the initial losses may lead to further bond sell-offs and loan cutbacks.

14. An EME slowdown may further hit high-income countries through currency depreciations in EMEs. Assuming that all external assets are denominated in foreign currency and liabilities are all denominated in domestic currency, suggests an upper bound for the decline in external wealth from a 10% appreciation of high-income countries' currency *vis-à-vis* EMEs of about 1% of GDP.[6] For countries with large financial exposures to EMEs, such as the United Kingdom, Switzerland and the Netherlands, the decline in net external wealth could amount to up to 2.5% of GDP. Net wealth effects would thus be equivalent to a decline in equity prices of 1-2.5% for high-income countries with equity market capitalisations of around 100% of GDP, which according to macroeconometric model simulations would have first-year GDP effects of less than 0.1%.

15. Financial exposures based on official external asset and liabilities are likely to understate most high-income countries' financial vulnerabilities. The data on financial linkages presented above are based on the balance-of-payments residence principle, *i.e.* data report assets and liabilities *vis-à-vis* foreign residents. If investments in EMEs are predominantly channelled through financial centres the residence principle may not be an accurate representation of exposures to EMEs: for instance, the acquisition of shares by a high-income resident in an EME investment fund located in a high-income financial centre would not be reported as an EME asset but instead as a high-income country asset.[7] Assuming that assets *vis-à-vis* financial centres partly reflect indirect holdings of EME assets, financial exposures could be significantly larger for Switzerland and the United Kingdom but would nonetheless remain below 25% of GDP for all high-income countries considered in this paper (Figure 7, Panel B). It should be noted that Switzerland and the United Kingdom may themselves be considered as financial centres, suggesting that their exposures to EMEs may be overstated as other high-income countries may partly channel EME investments through the Swiss and British financial systems.

16. Commodity exporters, including OECD countries such as Australia, Canada, Chile and Norway, may also be hit by lower commodity prices if a large EME slows down sharply: China accounts for around three fifths of world iron ore exports; close to one-third of copper exports; and around one-tenth of oil imports. On the other hand, lower commodity prices would benefit the majority of OECD countries which are net importers of commodities.

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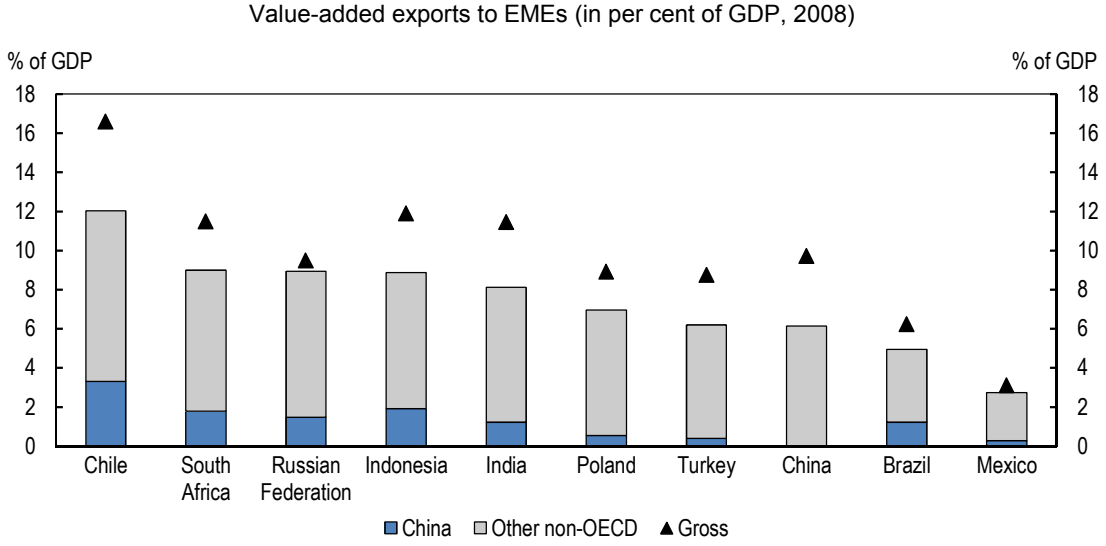
6. Portfolio and FDI equity assets in EMEs are predominantly denominated in EME currencies while liabilities are denominated in high-income country currencies; but for most high-income countries a significant part of debt assets vis-à-vis EMEs is denominated in high-income country currencies, implying limited effects of exchange rate depreciations. The results in Lane and Shambaugh (2011) suggest that less than 0.2% of external debt assets of the United States, Germany, France, Italy, Belgium and the Netherlands are held in other currencies than the US dollar, the British pound, the euro, the Japanese yen or the Swiss Franc. For the remaining countries considered in this paper the share of external debt assets held in non-high income country currencies is below 3%.

7. Official external asset and liabilities may also fail to fully account for derivatives contracts.

17. Overall, if the slowdown remains contained to individual EMEs, spillovers to most high-income countries are likely to be limited, but if a sharp slowdown in a large EME triggers a broader EME slowdown, then spillovers may be tangible. A sharp slowdown or financial tensions in a large EME may act as a "wake-up call" for investors to re-assess exposures to EMEs more broadly (Goldstein, 1998). Empirical analysis suggests that most EMEs remain exposed to such reversals in investor sentiment (Box 1). Sizable trade linkages among EMEs, both in gross and in value-added terms, suggest that a slowdown in a major EME may spill over to other EMEs through the trade channel (Figure 8). Commodity-exporting EMEs may also be hit by commodity price declines although a number of EMEs are partly shielded against short-term volatility through "rainy day funds", *e.g.* Chile, or the hedging of commodity revenues on financial markets, *e.g.* Mexico.

Figure 8. Sizable trade linkages among EMEs



Source: OECD-WTO Trade in Value Added database.

Box 1. Financial spillovers among EMEs

This box provides quantitative estimates of the degree of co-movement of EME exchange rates and sovereign bond yields in order to assess whether EMEs remain exposed to financial spillovers from other EMEs or sudden reversals in investor sentiment despite much improved fundamentals.

Dynamic Factor Models (DFMs) allow the variation in exchange rates and sovereign bond yields across EMEs to be decomposed into common and country-specific components:

$$x_{it} = \beta_i f_t + u_{it} \text{ with}$$

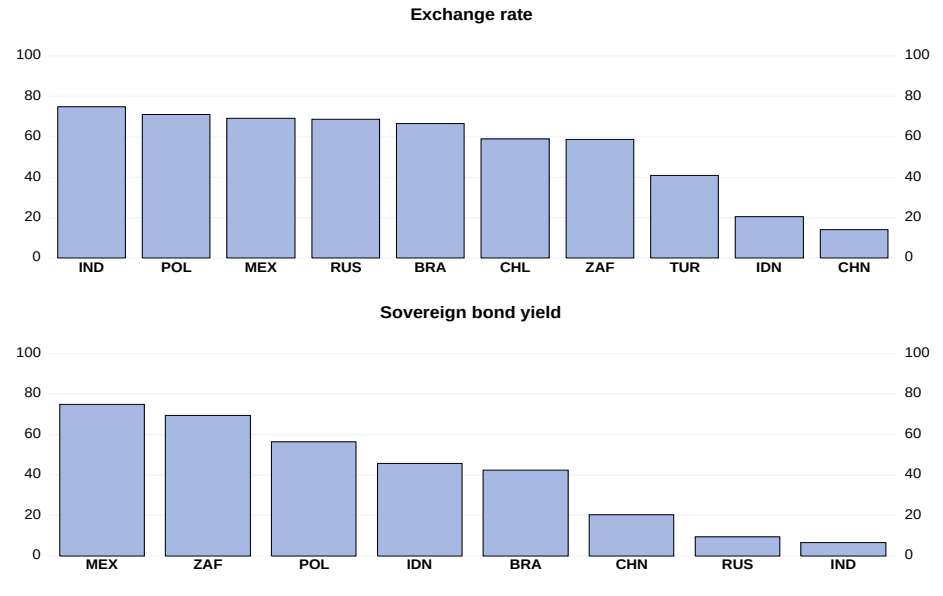
$$f_t = \emptyset f_{t-1} + \varepsilon_t \ ,$$

where x_{it} are (log) changes in exchange rates or sovereign yields in country *i* and period *t*; f_t is the common factor; the factor loadings β_i measure the sensitivity of exchange rate or sovereign yield changes in country *i* to the common factor; and u_{it} is the country-specific component. The common factor is modelled as an autoregressive process, with persistence $\emptyset$ and error term ε_t.

For most EMEs the common factor explains 40-80% of the variation in exchange rates and sovereign bond yields over the period 2010-13, suggesting that for most EME financial co-movements with other EMEs remains substantial (Box Figure). China appears to have decoupled from the common EME financial cycle, *i.e.* the country-specific component explains most of its exchange rate and sovereign yield variation, which may in part reflect strong fundamentals and a relatively closed financial account compared with other EMEs. For Indonesia and Turkey, the relatively low correlation with the common exchange rate component may reflect large foreign exchange rate interventions over 2010-13 (Basu and Varoudakis, 2013; Warjiyo, 2013) although the room for future foreign exchange intervention in case of a common EME shock may be limited. The apparent decoupling of Russia and India from the common sovereign yield cycle likely reflects below-average shares of government debt held by foreigners (around 8% for India and 24% for Russia according to IMF, 2013a), but yields on non-government securities may be more highly correlated with the common EME factor.

The empirical analysis thus suggests that most EMEs remain strongly exposed to developments in other EMEs and to sudden reversals in investor sentiment. However, it should be noted that a large share of exchange rate or sovereign yield variation explained by the common EME factor does not necessarily imply high downside risk: countries with relatively low domestic and external vulnerabilities, such as Poland or Mexico, may be better able to deal with large swings in exchange rates and sovereign yields, than countries with weaker fundamentals, such as India or South Africa.

Box Figure: Exchange rate and sovereign bond yield variation explained by EME common factor 2010-13



Note: Based on monthly dynamic factor models estimated over the period 2000-13 for exchange rates and 2007-13 for sovereign bond yields, with the shorter sample for the latter reflecting limited data availability before 2007. Additionally to the reported EMEs, the estimation sample includes: Argentina (only for exchange rates), Hong Kong, Hungary, Malaysia, Philippines, Singapore, Thailand and Taiwan.

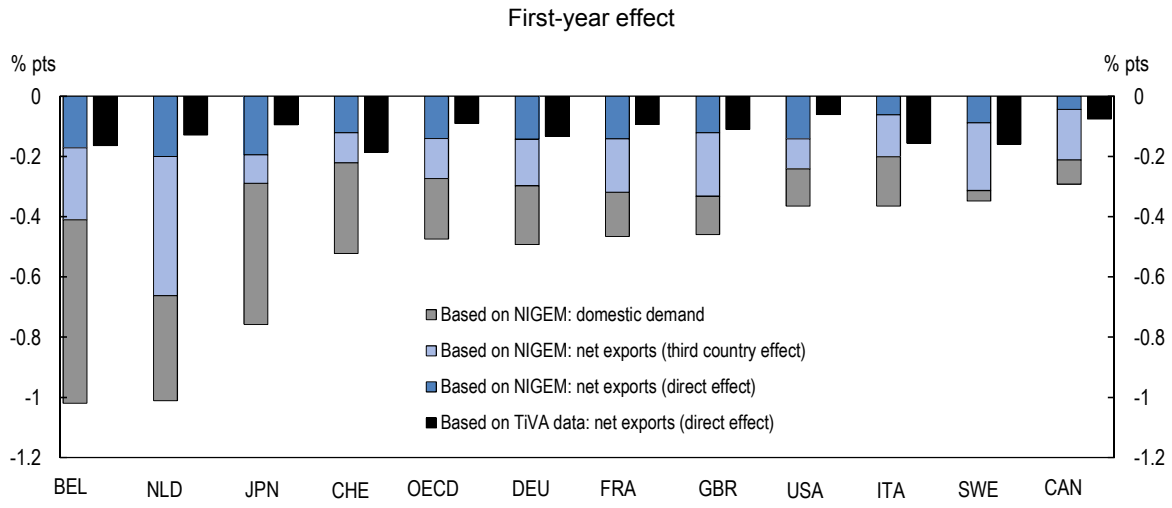
Source: OECD calculations.

4. Spillovers: Illustrative orders of magnitude

18. Simulations on NiGEM, the global macroeconometric model of the National Institute of Economic and Social Research, suggest that direct and indirect trade spillovers from a 2 percentage point decline in domestic demand growth in non-OECD countries (including China) would reduce GDP growth in OECD countries by around ½ percentage point on average, assuming that exchange rates and monetary policy do not react (Figure 9). The countries that would be most heavily hit include small open economies with the large trade exposures to non-OECD countries, such as Belgium, Netherlands and Switzerland, as well as large capital goods exporters, such as Japan and Germany.

19. For most high-income countries, the direct impact on net exports of a 2 percentage point decline in domestic demand growth in non-OECD countries implied by NiGEM is similar to the one implied by trade in value added data, suggesting that NiGEM appropriately accounts for input-output linkages across countries (Figure 9).[8] However, the overall GDP effect in NiGEM is mainly driven by multiplier effects on domestic demand and third-country effects on net exports, *i.e.* a decline in imports from third countries (including other OECD countries) in response to domestic demand declines.

Figure 9. Trade spillovers of 2% decline in non-OECD domestic demand



Note: The direct effect of net exports in NiGEM is computed as the decline in exports implied by the decline in export market size directly attributable to the decline in non-OECD domestic demand minus the decline in imports directly attributable to the fall in exports to non-OECD countries (this uses only estimated import demand elasticities of the individual trade equations in NiGEM and is not the result of a dynamic simulation of the full model). The "third-country" net export effect in NiGEM reflects the decline in export market size implied by declines in domestic demand and imports in third countries (*i.e.* other OECD countries) in a full model simulation. The direct net exports effect based on TiVA data is computed as the decline in value-added exports implied by a decline in non-OECD final demand of 2% (holding constant the high-income country's share in non-OECD final demand).

Source: OECD-WTO Trade in Value Added database and OECD calculations.

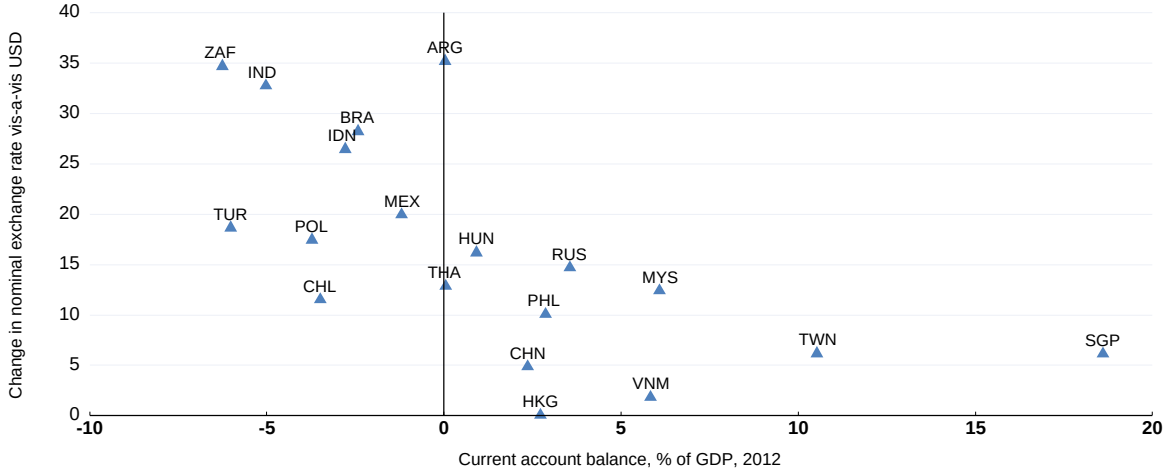
20. If the EME slowdown is accompanied by depreciations of EME currencies, model-based simulations suggest trade spillovers to high-income countries could be around 0.1 percentage point higher than in the constant exchange rate scenario. In the wake of the Fed discussions on the timing of US

8. In NiGEM input-output linkages across countries are modelled by assuming that imports respond positively to exports, with the size of the response based on estimated elasticities, but differences in the import content of exports across different export destinations are not accounted for. Nonetheless, for the above scenario, differences in the direct effect on net exports between NiGEM and trade in value-added data appear to be mostly small.

monetary policy normalisation in mid-May, a number of EME currencies depreciated, with especially large depreciations in current account deficit EMEs (Figure 10). In the illustrative scenario considered here, it is assumed that currencies of current account deficit EMEs depreciate by 20% with respect to the US dollar (about the average depreciation of current account deficit EMEs between mid-May and mid-November 2013). Although this would support activity in EMEs, the net spillovers to high-income countries would be negative as enhanced export competitiveness of EMEs would reduce high-income countries' net exports. Negative spillovers would be particularly large for some small open economies such as Belgium and the Netherlands (around 0.2% of GDP) but would be below 0.1% of GDP for the United States.

Figure 10. Larger currency depreciations for current account deficit EMEs

Maximum exchange rate depreciation over 15 May 2013 – 15 November 2013



Source: OECD calculations.

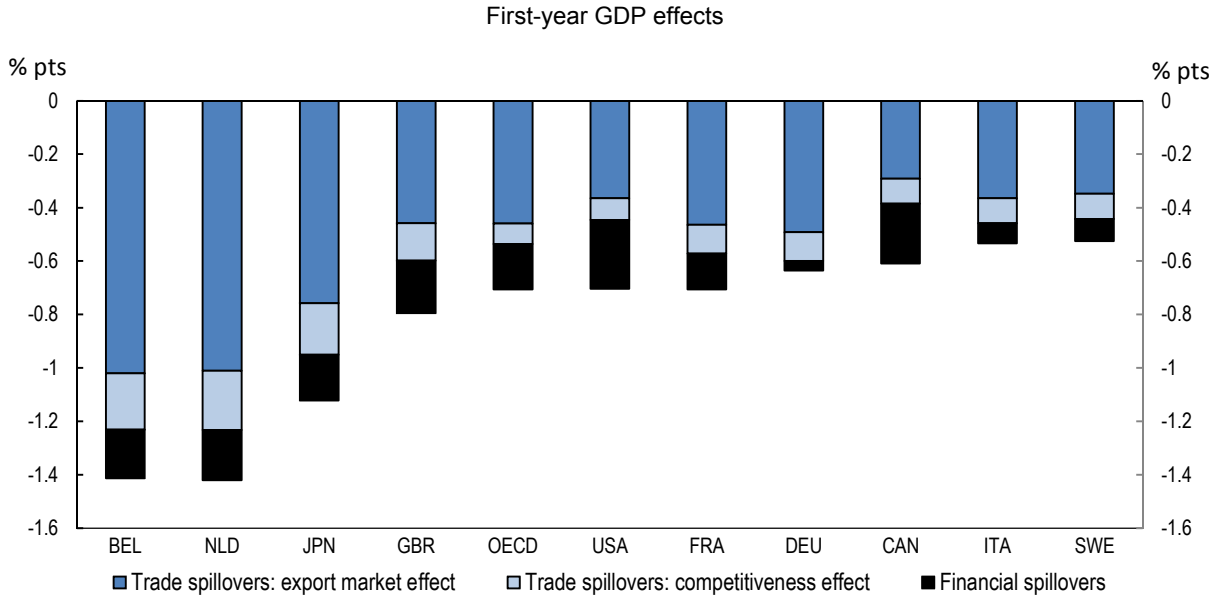
21. Financial turbulence in EMEs may spill over to risk assets more broadly, thereby reducing equity valuations in high-income countries and raising interest spreads in bond markets. Miranda-Agrippino and Rey (2012) find that a large part of the variation in risky asset prices across countries is explained by a global factor, which is in turn closely related to indicators of risk aversion. Financial tensions in EMEs may act as a "wake-up call" for investors (Goldstein, 1998). Consequent declines in asset valuations and increases in bond spreads may adversely affect activity through a tightening in financial conditions. Indeed, empirical studies suggest that only a small fraction of business cycle co-movement across countries – including during the global crisis of 2008-09 – can be explained by trade and financial linkages (IMF, 2013b).

22. Confidence spillovers can be simulated in NiGEM by assuming financial turbulence in EMEs raises investor risk aversion and thereby reduces asset prices in high-income countries. In the illustrative scenario considered here equity price declines in non-OECD countries are assumed to induce an increase in the equity risk premium of 50 basis points in OECD countries.[9] The simulations suggest that such a financial shock would reduce GDP growth in OECD countries by 0.2 percentage points with respect to baseline. The spillovers would be largest in countries with large equity market capitalisation such as the United States, the United Kingdom, Japan and Canada.

9. On average, a 50 basis points increase in the risk premium reduces equity prices by around 7% in OECD countries.

23. Overall, these scenarios suggest that spillovers from a broad growth slowdown in EMEs could be tangible for high-income countries, but would nonetheless remain manageable for macroeconomic policy. The combined effect from a domestic demand slowdown in EMEs and from financial tensions – which may reflect the combined effects from a slowdown in trend growth and the tightening of external financing conditions in response to the normalisation of monetary policy in high-income countries – would reduce GDP growth in high-income countries by around ⅔ percentage points on average (Figure 11). In a number of countries with strong trade and financial links with EMEs the effects may be larger and reduce GDP growth by the order of 1 percentage point.

Figure 11. Combined trade and financial spillovers of a 2% decline in non-OECD domestic demand



Note: Based on NiGEM simulations. Combined spillovers on high-income countries of a 2% decline in non-OECD domestic demand; a 20% currency depreciation *vis-à-vis* the US dollar of current account deficit EMEs; and a 10% decline in non-OECD equity prices and 50 basis points increase in the risk premium in OECD countries. Switzerland is not reported as the risk premium is not modelled in NiGEM.

Source: OECD calculations.

24. This suggests that high-income economies' central banks should take into account feedback effects of the normalisation of monetary policy. Although for the United States trade spillovers from a slowdown in EMEs are below the OECD average, the model simulations suggest that combined trade and financial spillovers would be similar to the OECD average, with any 1 percentage point decline in EME growth reducing US growth by around ⅓ percentage point. For Japan, feedback effects from monetary policy normalisation could be even larger, with the rule of thumb emerging from the model-based simulations suggesting that any 1 percentage point decline in EME growth would reduce Japanese growth by around ½ percentage point.

25. The model-based simulations fail to account for tail risks, such as the failure of a highly-leveraged financial institution in a high-income country, which highlights the need to restore bank balance sheets. Although at the aggregate level for most high-income countries financial exposures to EMEs are low relative to exposures to other high-income countries, for individual financial institutions exposures may nonetheless be substantial. Given current bank capital buffers in a number of high-income countries, even small losses on EME assets may trigger capital shortfalls. Ambitious stress tests should therefore explicitly include shocks to EME growth and financial turbulence in EMEs.

26. Moreover, trade and financial linkages as represented in NiGEM may not fully capture exposures through financial derivatives: the near-failure of the highly-leveraged US LTCM hedge fund in the wake of the Russian crisis of 1998 illustrates that large financial vulnerabilities may lurk beneath ostensibly weak trade and financial links at the aggregate level (Dungey *et al.*, 2002). If the Federal Reserve had not intervened to orchestrate a bailout by creditor banks and if it had not significantly eased monetary policy, effects on activity may well have been substantial.

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