

What is behind the recent slowdown?

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Manufacturing and trade have slowed in recent months, even as domestic consumption has remained relatively more resilient, underpinned by the services sector and strong employment. Surveys of the manufacturing sector in Europe began to show weaker activity in 2018, and the weakness has deepened into 2019, as can be seen in Graph 1 on the purchasing managers’ indices (PMIs) in manufacturing.

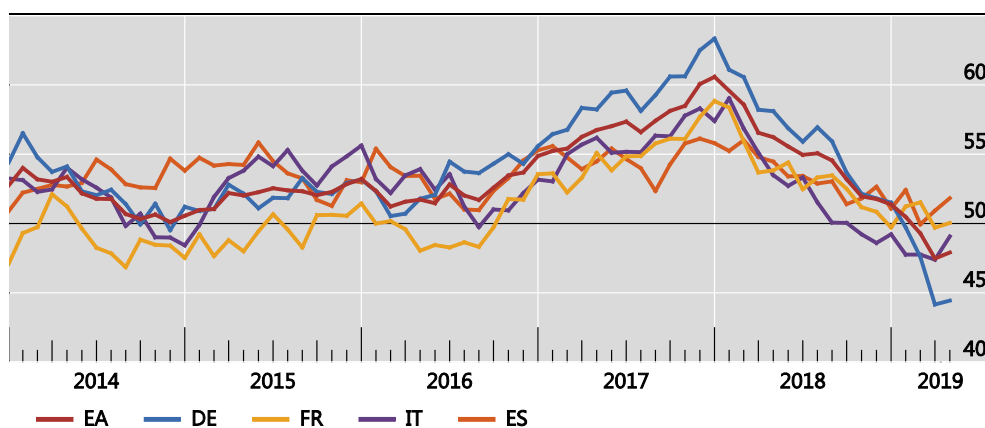
Germany has been at the sharp end of the manufacturing slowdown. The Ifo business climate indices by sector in Graph 2 highlight the weakness in manufacturing and in trade, and their contrast with the relatively stronger picture in the services and property sectors. These two domestically oriented sectors (services and property) have so far supported employment and domestic consumption in Germany, although this divergence cannot be expected to continue indefinitely.

Importantly, the weakness in manufacturing and trade has not been confined to Europe – far from it. That weakness has been more widespread, and has followed the contours of the trade links in manufactured goods through global value chains (GVCs). Asian economies that are enmeshed in supply chains with firms in China have been particularly hard hit.

PMIs for the manufacturing sector

Diffusion indices¹

Graph 1



¹ A value of 50 indicates that the number of firms reporting improvement and deterioration is equal; a value above 50 indicates improvement.

Source: IHS Markit.

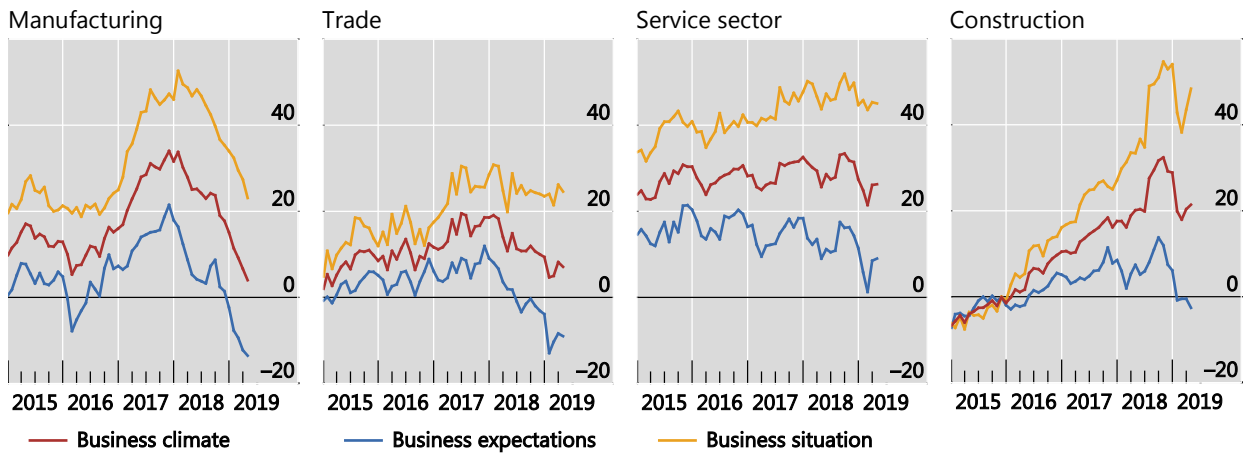
¹ I thank many BIS colleagues for comments on previous versions and Burcu Erik, Zuzana Filková, Anamaria Illes, Nicolas Lemerrier, Taejin Park and José María Vidal Pastor for excellent research assistance. The views expressed here are my own and not necessarily those of the Bank for International Settlements.



Germany: Ifo business climate index by sector

Balances, seasonally adjusted¹

Graph 2



¹ The balance value for the business situation (expectations) is computed as the difference between the percentages of the responses “good” (“more favourable”) and “poor” (“more unfavourable”). The business climate is a transformed mean of the balances of the business situation and the expectations.

Source: Ifo Institute for Economic Research, *Business Survey*, April 2019.

What explains the slowdown in manufacturing and trade, even as the services sector and employment remain strong?

A brief history

Some historical perspective is useful. Manufactured goods constitute 70% of global merchandise trade, and trade in manufactured goods powered the increase in world trade.² During the heyday of globalisation in the late 1980s and 1990s, trade grew at twice the pace of GDP. In turn, trade growth in manufactured goods was driven by the growing importance of multinational firms and the development of GVCs that knit together the production activity of firms around the world.

In step with the growing importance of multinational firms and GVCs, the geographical structure of GVCs themselves also underwent profound changes with the entry of China into the global trading system.

Graph 3 presents two snapshots of the network structure of trade, in 2000 and then in 2017.³ The spokes in these hub-and-spoke diagrams link two economies if one is the largest trading partner of the other, or if one accounts for more than 25% of the trade for the other. In 2000, the hubs in the global trading system were Germany, Japan and the United States. In 2017, China emerged to occupy the central

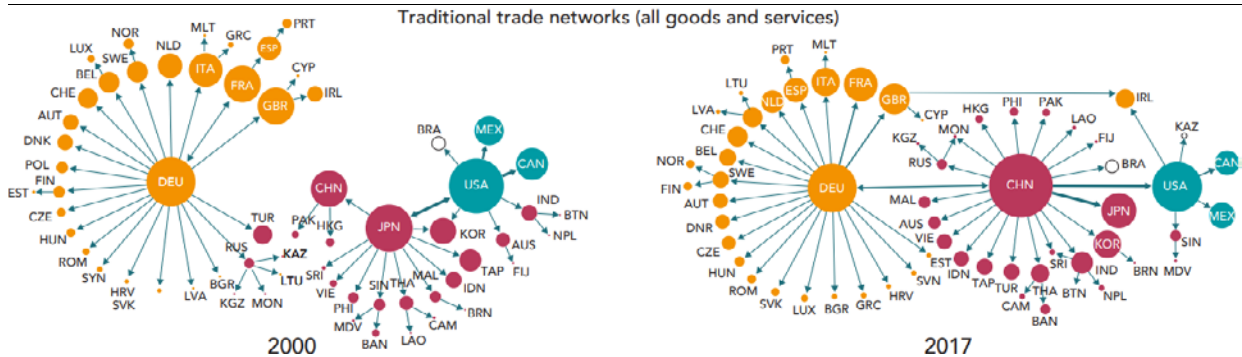
² See World Trade Organization, *World Trade Statistical Review 2018*, https://www.wto.org/english/res_e/statis_e/wts2018_e/wts2018_e.pdf; and Bank for International Settlements, “Understanding globalisation”, *87th Annual Report*, Chapter VI, June 2017.

³ This chart is from X Li, B Meng and Z Wang, “Recent patterns of global production and GVC participation”, in D Dollar (ed), *Global Value Chain Development Report 2019*, co-published by World Trade Organization, Institute for Developing Economies, Organisation for Economic Co-operation and Development, Research Center of Global Value Chains at the University of International Business and Economics, World Bank Group and China Development Research Foundation (<https://www.brookings.edu/blog/order-from-chaos/2019/04/15/how-global-value-chains-open-opportunities-for-developing-countries/>).

space, serving not only as a hub for Asia, but also as the connecting node between Germany and the United States.

Network structure of global value chains in 2000 and 2017

Graph 3



Source: X Li, B Meng and Z Wang, "Recent patterns of global production and GVC participation", in D Dollar (ed), *Global Value Chain Development Report 2019*, World Trade Organization et al (see footnote 3 for full reference).

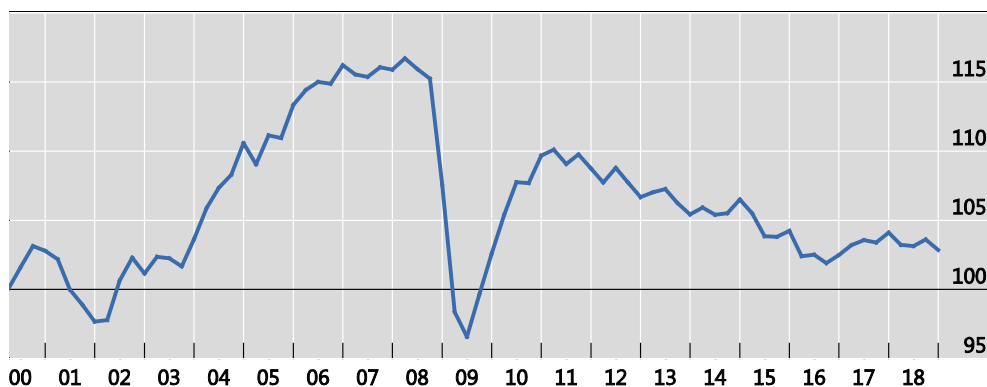
In seeking to understand the slowdown in manufacturing, a good starting point is to look at the current state of world trade and GVCs.

In tracking the importance of GVCs, a useful summary measure of their weight in the global economy is the ratio of world goods exports to world GDP. Graph 4 plots this measure for the last 20 years or so. This ratio serves as a useful proxy for the extent of GVC activity because exports are measured in *gross terms*, whereas GDP is measured in *value added terms*. That is, world exports measure the simple sum of goods that change hands along the supply chain, including exports of goods that have used imported intermediate goods as inputs. In contrast, GDP measures the value added at each stage, and attempts to capture only the value of final goods.⁴ So, when GVCs are active and intermediate goods trade more along the supply chain, the higher are world goods exports relative to world GDP. This ratio of trade to GDP is plotted in Graph 4.

Ratio of world goods exports to world GDP

In constant prices, Q1 2000 = 100

Graph 4



Sources: IMF, *World Economic Outlook*; World Trade Organization; Datastream; national data; BIS calculations.

⁴ The series in Graph 4 is constructed as the ratio of real exports to real GDP, and can differ from the ratio of nominal exports to nominal GDP due to the different price deflators used for exports and GDP. For this reason, trade intensity – the elasticity of trade to GDP – is computed using real quantities. See WTO, *World Trade Statistical Review 2018*, op cit.



The graph shows a striking pattern. World trade grew rapidly until the Great Financial Crisis (GFC) of 2007–09, but there has been a broad reversal since, indicating that GVC activity has been declining in the post-crisis period. World trade rebounded in the immediate aftermath of the GFC, but it never regained its pre-crisis level. Indeed, trade has been on a downward trend relative to GDP since 2011, with only a brief respite in 2017. This pattern is important in helping us grasp the underlying forces that have led to the recent weakness in GVC activity.

Significantly, the slowdown in trade predates the retreat into protectionism and trade conflicts in the last couple of years. Thus, the relative decline in trade had been in place before the market commentary became dominated by discussions of trade disputes and protectionism.

GVC activity fluctuates with financial conditions

Graph 4 is also striking in another respect. The ups and downs of this series bear an uncanny resemblance to the ups and downs of the global banking sector. It turns out that there are good reasons for this similarity.

Building and sustaining GVCs are highly finance-intensive activities that make heavy demands on the working capital resources of firms. When the financial requirements go beyond the firm's own resources, the necessary working capital is dependent on short-term bank credit. The financing requirement for GVCs arises because firms need to carry inventories of intermediate goods or carry accounts receivable on their balance sheet when selling to other firms along the supply chain. Inventories and receivables are assets of the firm and, like other assets on the balance sheet, they must be financed somehow. As supply chains grow longer and the time period between shipments becomes more extended, the marginal financing needs grow at an ever increasing rate, so that very long GVCs are viable only with very accommodative financing conditions.⁵

If you will excuse a colourful metaphor, firms enmeshed in global value chains could be compared to jugglers with many balls in the air at the same time. Long and intricate GVCs have many balls in the air, necessitating greater financial resources to knit the production process together. More accommodative financial conditions then act like weaker gravity for the juggler, who can throw many more balls into the air, including large balls that represent intermediate goods with large embedded value. However, when the shadow price of credit rises, the juggler has a more difficult time keeping all the balls in the air at once.

When financial conditions tighten, very long and elaborate GVCs will no longer be viable economically. A rationalisation of supply chains through "on-shoring" and "re-shoring" of activity towards domestic suppliers, or to suppliers that are closer geographically, will help reduce the credit costs of supporting long GVCs.

In its 2014 report⁶ on trade financing, the BIS's Committee on the Global Financial System (CGFS) found that around 35% of trade was financed by the banking system. The rest – around 65% – was financed by the firms themselves, either by the seller in the form of "open account financing" or by the buyer paying upfront in a "cash-in-advance" purchase.

⁵ See V Bruno, S-J Kim and H S Shin, "Exchange rates and the working capital channel of trade fluctuations", *AEA Papers and Proceedings*, May 2018, vol 108, pp 531–36.

⁶ See Committee on the Global Financial System, "Trade finance: development and issues", *CGFS Papers*, no 50, January 2014.



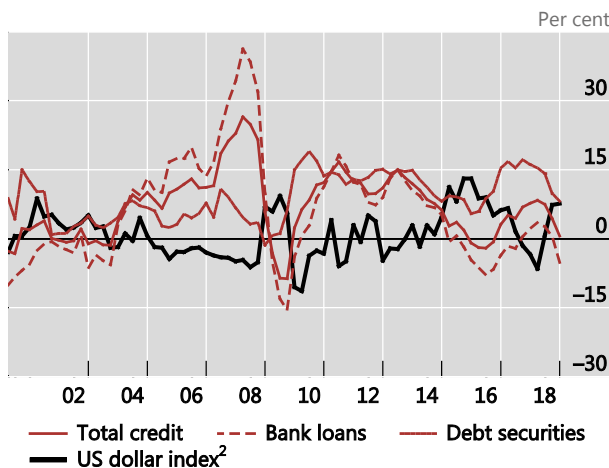
Crucially, the CGFS found that around 80% of bank trade financing was denominated in US dollars, reflecting the prevalence of dollar invoicing in world trade. Given the prevalence of dollar credit in supporting trade, factors that influence credit conditions and the supply of dollar lending by banks play an important role in supporting GVC activity.⁷ Among the many indicators of the availability of dollar-denominated bank credit, the dollar exchange rate plays a particularly important role as a barometer of the dollar credit conditions faced by firms. Lending in dollars tends to grow faster when the dollar is weak, and lending in dollars is subdued or declines when the dollar is strong. Graph 5 illustrates the negative relationship between the strength of the dollar and lending in dollars. Particularly striking is the contrast between rapid bank lending in dollars before the GFC, and subdued bank lending in dollars since.⁸

When combined with the fact that GVC activity tracks dollar financing conditions, the upshot is that the fluctuations in the trade-to-GDP ratio plotted in Graph 4 closely track the strength of the dollar, with a stronger dollar associated with subdued GVC activity. We see this in the right-hand panel of Graph 5. The ratio of trade to GDP that we saw in Graph 4 is closely related to the strength of the dollar. During periods when the dollar is strong, trade is low relative to GDP. During periods when the dollar is weak, trade is high relative to GDP. Gita Gopinath of the IMF has highlighted a closely related invoicing channel of trade fluctuations, which also has the empirical implication that a stronger dollar is associated with more subdued trade activity.⁹ Invoicing can affect trade when the invoice price is sticky in dollar terms.

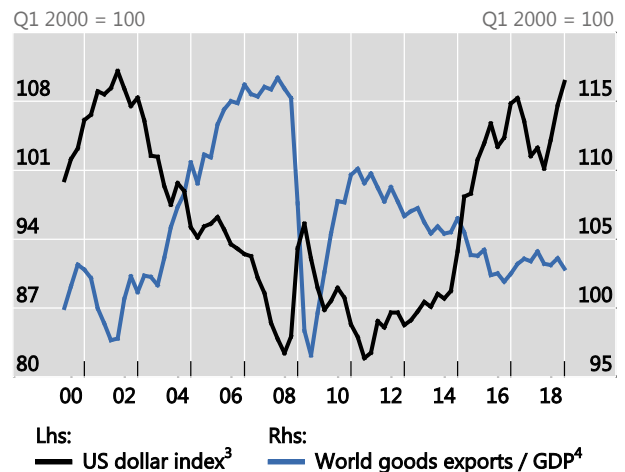
Dollar credit growth and GVC activity are negatively related to dollar strength

Graph 5

US dollar credit to emerging market economies (EMEs)¹



Global trade and US dollar



¹ Annual growth of credit to non-banks denominated in US dollars. ² Annual growth of Federal Reserve Board trade-weighted nominal dollar index, major EMEs ("other important trading partners"), based only on trade in goods. A positive value indicates appreciation of the US dollar. ³ Federal Reserve Board trade-weighted nominal dollar index, broad group of major trading partners of the US ("broad"), based only on trade in goods. An increase indicates appreciation of the US dollar. ⁴ Both exports and GDP are measured in constant prices.

Sources: Federal Reserve Bank of St Louis, FRED; IMF, *World Economic Outlook*; World Trade Organization; Datastream; Dealogic; Euroclear; Thomson Reuters; Xtrakter Ltd; national data; BIS locational banking statistics; BIS calculations.

The striking inverse relationship between world trade and the strength of the dollar is a correlation, and we should not rush to infer a direct causal relationship. The exchange rate is an

⁷ Evidence is to be found in J Serena and G Vashista, "What drives bank-intermediated trade finance? Evidence from cross-country analysis", forthcoming in the *International Journal of Central Banking*.

⁸ See S Avdjiev, V Bruno, C Koch and H S Shin, "The dollar exchange rate as a global risk factor: evidence from investment", *IMF Economic Review*, March 2019, vol 67, issue 1, pp 151-73.

⁹ See G Gopinath, "The international price system", proceedings of the Federal Reserve Bank of Kansas City Symposium at Jackson Hole, August 2016; G Gopinath and J Stein, "Trade invoicing, bank funding, and central bank reserve holdings", *AEA Papers and Proceedings*, May 2018, vol 108, pp 542-46; and G Gopinath, E Boz, C Casas, F Díez, P-O Gourinchas and M Plagborg-Møller, "Dominant currency paradigm", *NBER Working Papers*, no 22943, March 2019.



endogenous variable, after all. Nevertheless, a broad index of dollar strength serves a useful purpose as a concurrent indicator of dollar credit conditions.

The dollar has remained strong into 2019, despite the more accommodative monetary stance of the Federal Reserve. The relationship between financial conditions and the dollar will reflect many forces operating in the economy, but among these may be balance sheet channels involving non-financial firms that are linked through GVCs. Strong corporate balance sheets enable firms to meet the heavy working capital needs of being part of GVCs. However, higher corporate debt combined with currency mismatches on the firm's balance sheet can undermine the firm's ability to finance working capital, especially when credit conditions tighten. Firms weighed down by currency mismatches and excessive leverage will need to reduce debt and rebuild capital.

Globally, high corporate leverage has emerged as a source of vulnerability for growth. Corporate leverage has remained high even as profitability has declined sharply in some jurisdictions, such as China and especially among small and medium-sized enterprises in the manufacturing sector. Within this broad context, the continuing strength of the dollar may reflect, in part, efforts at balance sheet repair by such firms. A stronger dollar would increase the urgency of balance sheet repair, as it would sharpen the incentives to repay dollar debt.

Perhaps for this reason, recent moves in the currency market have overturned the usual rule of thumb that looser monetary policy in the United States is associated with a weaker dollar. The dollar has remained strong, especially against emerging market currencies.

Some of you may retort that this channel does not apply to Germany in that German manufacturing firms will be relatively less reliant on dollar trade financing, as they borrow in euros. However, bear in mind that survey respondents among manufacturing firms consistently cite weak external demand conditions as the main culprit for weak activity. So, even if German firms themselves are less reliant on dollar funding, it may be that their trading partners are much more dependent on trade financing in dollars. Nor can attention be limited to the direct trading counterparties with Germany, as indirect trade links will ripple through the global trading system. Such are the consequences of the interconnected nature of the global trading system.

The philosopher René Descartes famously argued that the nature of the mind is distinct from that of the body, and that it is possible for one to exist without the other. Similarly, in debates about trade globalisation, there is a tendency to draw a sharp distinction between trade and finance. It is tempting to think that real openness in trade and investment is chiefly about removing trade barriers. However, Graph 4 on the fluctuations of GVC activity shows that this is far too simplistic. In practice, trade and manufacturing are very closely intertwined with finance, especially banking sector credit.

Manufacturing and finance could, in fact, be so closely related that we may even entertain the notion of "bubbles" in global value chain activity, just as there are in asset markets. The overextended network of GVCs that were strung out across the world in 2006–07 may have been sustainable only with the extraordinarily loose financial conditions that were then prevailing. More recently, the reversal of the 2017 mini-boom in manufacturing should give policymakers pause for thought as to what constitutes a *durable* impetus to global growth. Even when the growth spurt comes from trade and manufacturing, it may not be strong enough to bear the burden of sustaining global growth. The *composition* of demand may matter as well as the total amount.



Implications for policy

Financing of working capital to sustain manufacturing and trade shines a light on the role of the banking sector. Banks are crucial for the provision of trade financing, and a strong banking sector augments the firms' own financial resources to meet working capital needs.

Yet the banking sector has been stuck in low gear since the GFC. While post-crisis reforms have increased the resilience of banks by enhancing their loss-absorbing capacity, banks' lending growth has been disappointingly weak. Above all, the book equity of the banking sector, which serves as the foundation for banks' lending, has stalled.

Graph 6 shows that book equity growth has slowed drastically since the GFC, reflecting in part the low profitability of the banking sector, as well as continued dividend payouts and share buybacks. As book equity is the foundation for the lending by banks, the slow pace of book equity growth has gone hand in hand with stagnant lending growth.¹⁰ The sharp break in trend in equity and asset growth since the GFC is a graphic illustration of how, even a full decade after the crisis, the banking sector has not recovered from it. This is not just a story about Europe. The group of 75 large banks depicted in Graph 6 are drawn from around the world.

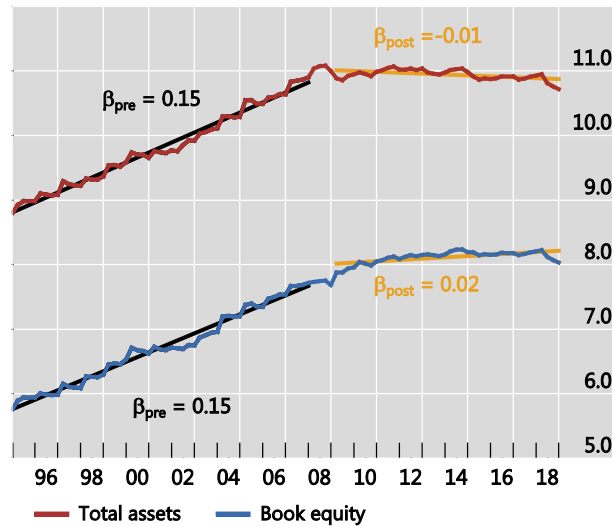
The weakness of the banking sector shines a light on the unintended side effects of a prolonged period of monetary accommodation that has weighed on bank profitability through negative interest rates and compressed long-term rates. It is commonplace to say that monetary policy is overburdened in the current economic environment, not least from the BIS. But this is a point that is especially relevant for the impact of monetary policy on GVCs and manufacturing activity. Bank lending and corporate balance sheet strength are key to the financial backing underpinning GVCs. While low interest rates in advanced economies have helped bolster consumption and support strong employment growth, the impact on bank lending that bears more directly on GVCs has been arguably less effective. Nor can we say that the impact of monetary policy on corporate leverage has been unambiguously positive. Companies have taken advantage of low long-term interest rates to borrow long-term through capital markets, and have used the proceeds in financial transactions, either in acquisitions or to buy back their own shares. Real investment unrelated to property is more closely tied to the health of the manufacturing sector and has been subdued. More recently, leveraged loans issued by less creditworthy firms have been receiving increasing attention from policymakers as a potential source of financial stress for firms.

¹⁰ See L Gambacorta and H S Shin, "Why bank capital matters for monetary policy", *Journal of Financial Intermediation*, vol 35, 2018, pp 17–29; and H S Shin, "Bank capital and monetary policy transmission", panel remarks at *The ECB and its Watchers XVII* conference, Frankfurt, 7 April 2016.

Banking sector assets and book equity¹

Graph 6

Ln (USD bn)



¹ Sum of respective variables for a sample of 75 banks (as listed below). Ln denotes natural logarithm.

ANZ, Commonwealth Bank of Australia, Macquarie Group Ltd, National Australia Bank, Westpac Banking, Chiba Bank Ltd, Fukuoka Financial Group, Hokuohoku Financial Group Inc, Mitsubishi UFJ Financial, Mizuho Financial Group, Resona Holdings, Shizuoka Bank Ltd, Sumitomo Mitsui Financial, Sumitomo Mitsui Trust, Bank of Montreal, Bank of Nova Scotia, Canadian Imperial Bank, National Bank of Canada, Royal Bank of Canada, Toronto-Dominion Bank, BB&T Corp, Bank of America Corporation, Bank of New York Mellon Corp, Capital One Financial Corp, Citigroup Inc, Citizens Financial Group Inc, Fifth Third Bancorp, JPMorgan Chase & Co, Morgan Stanley, Goldman Sachs Group Inc, Northern Trust Corp, PNC Financial Services Group, Regions Financial Corp, State Street Corp, SunTrust Banks Inc, US Bancorp, Wells Fargo & Co, Erste Group Bank, RBI AG, Dexia, KBC Group, Commerzbank, Deutsche Bank, BBVA, Banco Popular Español, Banco Santander, Banco de Sabadell, Bankia SA, CaixaBank, BNP Paribas, Crédit Agricole SA, Crédit Industriel, Natixis, Société Générale, AIB Group Plc, Bank of Ireland Group, Banca Monte dei Paschi, Banco Popolare, Intesa Sanpaolo, UniCredit, UBI Banca, ING Groep, Credit Suisse, UBS Group AG, Danske Bank, Barclays, HSBC Holdings, Lloyds Banking Group, Royal Bank of Scotland Group, Standard Chartered, DNB ASA, Nordea Bank Abp, Skandinaviska Enskilda Banken, Handelsbanken, Swedbank.

Sources: Datastream; BIS calculations.

Once the growth of manufacturing and trade through more intensive use of GVCs has run its course, relying excessively on manufacturing and goods trade may be setting the global economy up for disappointment. The experience of 2017 serves as a useful lesson. During 2017, manufacturing and trade grew strongly on the back of accommodative credit conditions and a weaker dollar. However, as we have been seeing in more recent months, some of the expansion of activity was vulnerable to a reversal of credit conditions.

These considerations bring us to the importance of the *composition* of demand and the role of fiscal policy. When the appropriate opportunities for long-term public investment arise, fiscal stimulus – through such investment projects taking advantage of low long-term interest rates – may be one way to reorient the economy towards domestic activity. The important point here is that such a reorientation would aid the rebalancing of the *composition* of demand as well as its overall size. The issue of fiscal space and long-run sustainability of public debt will then need to be addressed. These issues are beyond the scope of my presentation today, but I am sure they will figure in the discussions at this forum. I look forward to a lively debate.