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# **Winning the future markets for UK manufacturing output**

**Future of Manufacturing Project: Evidence Paper 25**

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# Winning the Future Markets for UK Manufacturing Output

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## Executive summary

- This Review draws on the resource-based and institution-based views, two core perspectives from the discipline of global business and strategy, to probe into the drivers behind UK manufacturing exports.
- UK goods exports declined from a world share of 5.2% in 1991 to 2.6% in 2011. The UK is the 11<sup>th</sup> largest goods exporter and 9<sup>th</sup> largest manufacturing nation (by gross value added).
- In absolute terms, the value of UK manufacturing exports grew by 46% between 2000 and 2011. However, the UK's relative decline in manufacturing exports appears to have accelerated in the last decade, not only vis-à-vis emerging economies but also relative to European peers (especially Germany).
- Absorbing 53.4% of all UK goods exported, the EU is the most important export destination. Although growing fast, exports to BRICS only represent 7.7% of all UK exports (of which 2.7% go to China).
- The Great Transformation of the global economy is likely to propel China, India, Brazil, and Russia, together with the United States, to become the top economies by 2050.
- However, UK manufacturing exports are currently not well positioned in these fast growing economies. In China and Russia, the UK only commands 0.9% and 2% import market share, respectively.
- Two scenarios of the world in 2050 can be described as (1) "continued globalization" and (2) "de-globalization." Both scenarios have in common that emerging economies will grow faster than today's mature economies.
- We predict UK manufacturing firms to continue to excel in industries in which the UK has revealed comparative advantage, such as aerospace, automobiles, chemicals, and pharmaceuticals. They will also be competitive in high-end niches, such as equestrian goods and leisure marine transport.
- In manufacturing industries using new technologies, the most promising ones include additive manufacturing (3-D printing), smart grid, tidal and wave energy system, new batteries, and intelligent medical devices.

From a resource-based view, our key recommendations for firm managers are:

1. Build organizational strengths based on the resource-based framework by focusing on the value, rarity, and inimitability (VRI) of resources and capabilities
2. Find and leverage unique, knowledge-based, deep niches
3. Look for value-adding ways to combine manufacturing with services

From a *resource-based view*, our key recommendations for government policymakers are:

4. Support pre-competitive manufacturing capabilities and future technology platforms
5. Push firms to reach for the high end and do not support competition on low cost for the sake of jobs
6. Strengthen human capital to enable advanced manufacturing

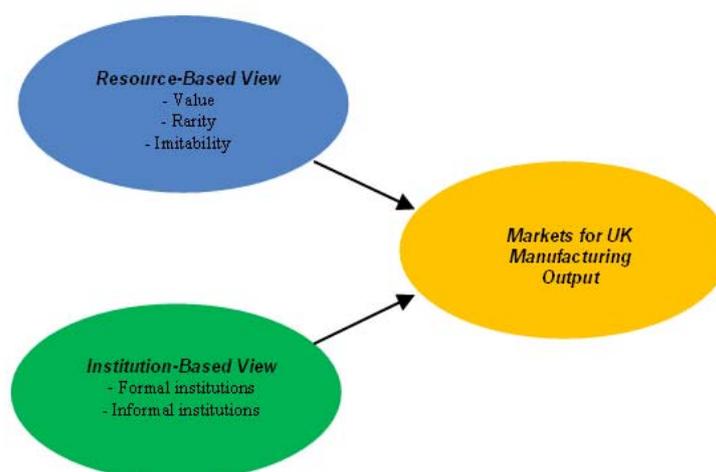
From an *institution-based view*, our key recommendations for government policymakers are:

7. Remove uncertainty by clarifying the UK's commitment to stay in the EU
8. Enhance certainty by negotiating more free trade agreements (FTAs)
9. Create a tax regime that is competitive, stable, and fair
10. Attract more inward FDI and promote more outward FDI in order to facilitate more exports
11. Facilitate the mobility of highly qualified individuals into and out of the UK
12. Lead efforts to lift regulatory trade barriers such as the EU arms embargo on China

# I. Overview

Why do nations trade? Although originating from Adam Smith, this question is misleading. Nations do not trade. *Firms* from different nations trade—by buying from and selling to each other. Why do firms from different nation's trade? A simple answer is that there must be mutual gains from trade. Translated into our area, the right question should be: Why do firms in different nations purchase/import UK manufacturing output/exports?<sup>1</sup> The answer must be: UK manufacturing output provides valuable, rare, and hard-to-imitate (VRI) contributions to the well being of individual and business buyers around the world. This is the essence of a *resource-based view* of competitive advantage in export markets (Barney, 2001; Peng, 2001). International trade, of course, is also governed by numerous formal and informal institutions known as the rules of the game. These institutions range from formal institutions such as the World Trade Organization (WTO) and the European Union (EU) to informal consumer sentiments. Therefore, the success and failure of UK manufacturing output around the world also depend on how various institutions impact international trade. This is a key proposition from the *institution-based view* (North, 1990; Peng et al., 2009). This Review draws on the resource-based and institution-based views, two core perspectives from the discipline of global business and strategy (Meyer and Peng, 2005; Meyer et al., 2009; Peng, 2014; Peng and Meyer, 2011), to probe into the drivers behind the markets for UK manufacturing exports (see Figure 1).

**Figure 1: Institutions, resources, and markets for UK manufacturing output**



Where are the future markets for UK manufacturing output? How can UK firms win these markets? How can the Government help? Endeavoring to address these forward-looking questions, this Review synthesizes and interprets the available evidence. We first use the resource-based and institution-based views to anchor our understanding of the previous and current markets for UK manufacturing output. We then probe into the likely scenarios with a view to 2025 and another view to 2050. We conclude with a series of recommendations to firm managers and government policymakers.

<sup>1</sup> In this Review, we define “manufacturing” according to the primary activity self-reported by an establishment. Non-production (non-assembly) service activities such as logistics, human resources, and R&D within a self-reported manufacturing establishment are counted as “manufacturing.” Within UK manufacturing firms, half of the employees (1.3 million of the 2.6 million jobs) provide such services (BIS, 2010b: 8). We do not count as “manufacturing” activities outsourced to outside service providers, such as third-party logistics and IT consulting. Our approach is consistent with most of the literature (McKinsey, 2012a: 18).

## 2. Resources, Institutions, and Previous Markets for UK Manufacturing Output

Modern manufacturing started in the UK during the (first) Industrial Revolution. In 1900, the UK accounted for approximately 2.2% of the world's population but 10% of global GDP (PwC, 2009) and 15% of global exports (UN, 2009). What made the UK such an export powerhouse? What then led the UK to lose some of its comparative advantage? While numerous answers have been provided, two modern perspectives drawn from the discipline of global business and strategy can shed considerable light on the drivers behind UK manufacturing performance.

In a nutshell, the resource-based view suggests that products win export markets when they (1) deliver *value*, (2) are *rare*, and (3) possess *hard-to-imitate* attributes (Barney, 2001; Peng, 2001). This can be viewed as a VRI framework. Moreover, competition is not static. Therefore, firms are constantly under pressure to develop *dynamic* capabilities that generate innovations to meet the VRI criteria in new rounds of competition (Teece, 2007).

Anchored by the VRI framework, the resource-based view can help us appreciate British manufacturing products' historical performance. During (or immediately after) the first Industrial Revolution, Britain became the “workshop of the world” first and foremost because of the value of its manufactures. At that time, few nations mastered manufacturing capabilities of note. In Europe, North America, India, and the Far East, the value of British products was widely appreciated. They were also rare, because they brought significant novelty to many economies that were using manufactures for the first time. Finally, they were hard-to-imitate, because (1) locally manufactured products were inferior and/or (2) manufactured products from Britain's rivals were either inferior or were kept out due to Empire policies that favored Made-in-UK manufactures.

In addition to product-specific (and technology-specific and firm-specific) features espoused by the resource-based view, the institution-based view (North, 1990; Peng et al., 2009) focuses on the (favorable or unfavorable) rules of the game as a way to explain the success and failure of UK exports. Leveraging its power to make rules in colonies, Britain formally discouraged (or sometimes simply banned) the development of local manufacturing capabilities—one of the leading causes for the American Revolution. Informally, the prestige associated with British products was also a selling point.

However, as the US, Germany, France, the Netherlands, and Scandinavia gradually developed manufacturing capabilities, not all British manufacturing industries were able to maintain their competitiveness in export markets. Between 1910 and 1935, Britain's “old staple” industries such as spirits/tobacco and textiles continued to have comparative advantage, but UK export competitiveness fell behind the US and Germany in “high-tech” (or R&D-intensive) industries of the early 20<sup>th</sup> century, such as chemicals, electrical products, and industrial equipment (Crafts and Thomas, 1986).

In resource-based terms, during (and immediately after) the Second Industrial Revolution, some UK exports essentially lost their value, were no longer rare, and could be increasingly imitated by rivals. In institution-based terms, the Great Depression (1929-1933) resulted in a loss of faith in free trade and pro-competition policies, which were replaced by more protectionist policies. Such reduction in competition reduced

productivity growth, which lasted well into the postwar period. For example, in the late 1950s, the UK's median tariff was twice the West German level (Crafts, 2010). Such institution-based, protectionist policies thus reduced the motivation for UK firms to enhance competitiveness.

Since the 1980s, the UK embarked on a journey to restore competitiveness, with competition emphasized, privatization promoted, and trade union power undermined (Owen, 1999). It began to close the productivity gap and per capita income gap against Germany and France (Crafts, 2012). In 2003, a major study on UK competitiveness by Michael Porter noted that "the decline in the international prosperity ranking has been halted and, to some degree, reversed" (Porter and Ketels, 2003: 43). At the same time, other commentators noted that industrial policies since the 1980s promoted service sector development and by default discouraged investment in the capabilities required for manufacturing sectors to compete globally. Either way, given the global competition, "UK companies will need to upgrade their productivity by competing on more unique and more innovative products and services" (Porter and Ketels, 2003: 43).

In summary, the resource-based and institution-based views offer us a great deal of insights into the performance of UK manufacturing in previous markets. The next section deals with how these two views lead to a better understanding of the current markets for UK manufacturing output.

### 3. Current State of Play

Looking across a large number of studies and leveraging our own analysis of data from the UK Office of National Statistics, the EU, the WTO, and the UN as well as Chinese and Russian statistical sources, we can highlight the following 12 stylized facts regarding the current state of play (Table 1):

**Table 1: UK manufacturing exports: Current state of play**

1. UK goods exports, most of which are manufactures, slowly declined from being 5.2% of the world in 1991 to 2.6% in 2011. In 2011, the UK did not make the top ten list for top goods exporters—the 10<sup>th</sup>-ranked Belgium exported more than the 11<sup>th</sup>-ranked UK.
2. Since 1998, UK trade deficit has been widening for manufacturing goods.
3. In addition to the more recent (post-2000) trend, the longer term (1980-2010) trend documents a more sustained loss of UK export competitiveness relative to European rivals.
4. Among the top 15 manufacturing nations (in terms of gross value added), manufacturing's share of GDP ranged from China's 33% (first) to the UK's and France's 10% (last).
5. The decline of UK manufacturing export competitiveness is *relative*. In absolute terms, in the decade between 1998 and 2008, the UK *increased* its goods exports by 72%, to US\$468 billion, and achieved a 50% increase in labor productivity.
6. The decline of UK manufacturing *jobs* is absolute. In 1980, one in four UK jobs was in manufacturing. In 2008, the number went down to one in ten.
7. There is a tremendous debate regarding the severity of the UK's competitiveness problems. On the one hand, one view suggests that the decline of manufacturing export market share and of manufacturing jobs is not a UK problem per se. Other developed economies have experienced similar challenges. On the other hand, a more critical view asserts that the UK's competitiveness problems are more severe, because UK manufacturing has been losing export market share relative to other developed economies.
8. While UK firms export to many countries throughout the world, the center of gravity measured by sales remains in the EU, which commands 53.4% of all UK goods exported.
9. UK exports to emerging economies, while growing, are still small in volume. Although the fast growing economies of China and India are ranked among the top three non-EU destinations in 2011, BRICS countries collectively bought only 7.7% of all UK exports in 2011, up from 3.5% in 2000.
10. In manufacturing, the UK excels in knowledge-intensive, high-tech industries such as pharmaceuticals, aerospace, chemicals, and automobiles.
11. However, a simple market share analysis does not reveal the changing nature of UK manufacturing exports, some of which are becoming more value-added and more competitive. The transformation of the UK automobile industry is a case in point. The UK now focuses on making premium cars (such as Bentley, Jaguar, and Rolls-Royce) and exports 84% of them around the world.
12. An exclusive (or excessive) focus on manufacturing exports may underestimate UK competitiveness in overseas markets. This is because the UK has the world's 2<sup>nd</sup> highest level of outward foreign direct investment (OFDI) stock and a lot of UK manufacturers produce abroad.

The UK's share of world exports (goods and services combined) declined from contributing 6% in 1980 to 3.3% in 2010 (BIS, 2012a: 34). While UK service exports excelled (being the world's second largest service exporter and commanding 6.6% of world share in 2011), UK goods exports slowly declined—from 5.2% of world share in 1991 (Porter and Ketels, 2003: 14) to 2.6% in 2011 (WTO, 2012: 30). In 2011, the UK failed to make the top ten list for top goods exporters—the 10<sup>th</sup> ranked Belgium exported more than the 11<sup>th</sup>-ranked UK (Table 2).

**Table 2. Top 15 trading nations, 2011**

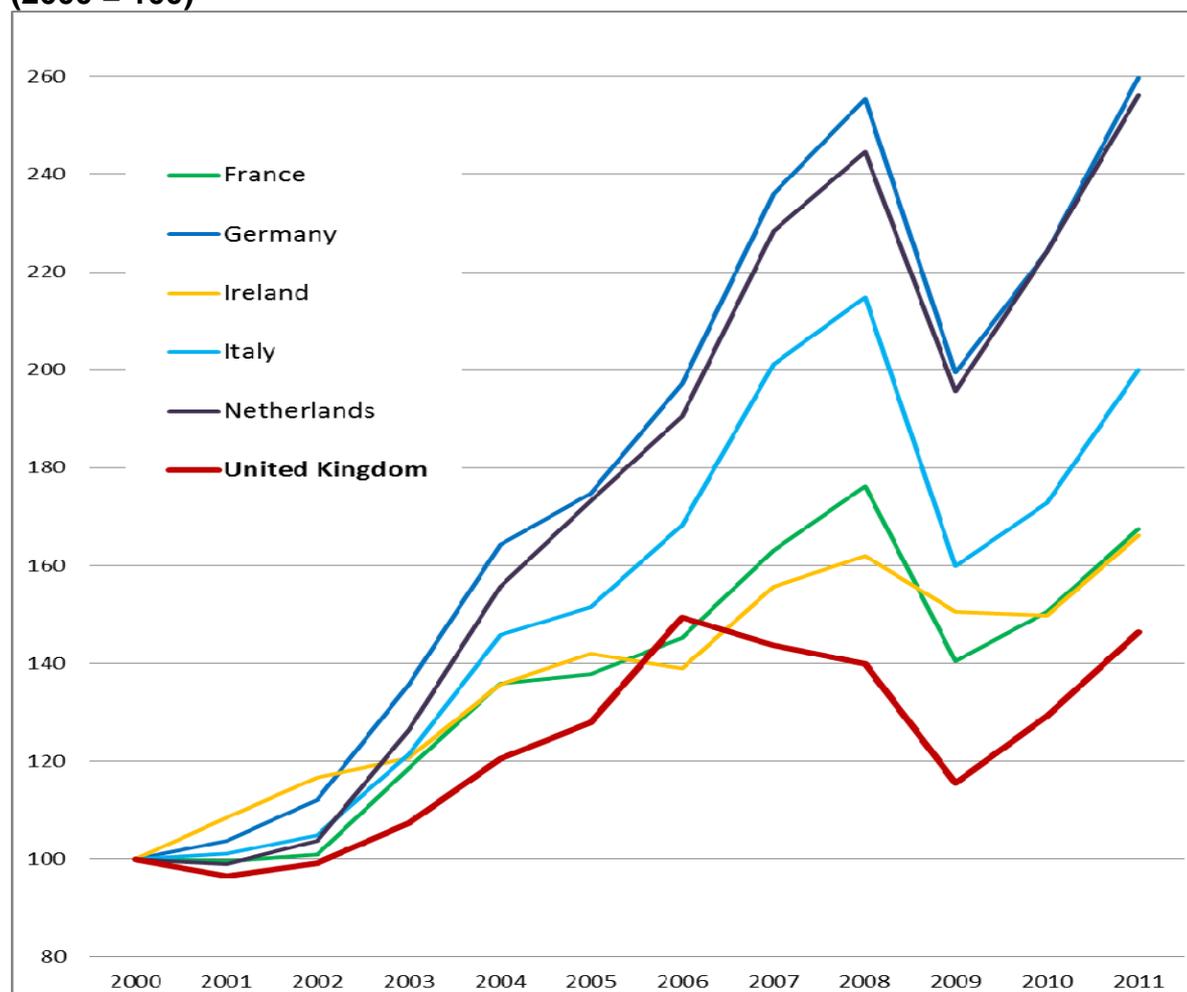
	Top 15 goods exporters	Value (\$ billion)	World share (%)	Annual change (%)		Top 15 goods importers	Value (\$ billion)	World share (%)	Annual change (%)
1	China	1,899	10.4%	20%	1	USA	2,265	12.3%	15%
2	USA	1,481	8.1%	16%	2	China	1,743	9.5%	25%
3	Germany	1,474	8.1%	17%	3	Germany	1,254	6.8%	19%
4	Japan	823	4.5%	7%	4	Japan	854	4.6%	23%
5	Netherlands	660	3.6%	15%	5	France	715	3.9%	17%
6	France	597	3.3%	14%	<b>6</b>	<b>UK</b>	<b>636</b>	<b>3.5%</b>	<b>13%</b>
7	South Korea	555	3%	19%	7	Nether-ands	597	3.2%	16%
8	Italy	523	2.9%	17%	8	Italy	557	3%	14%
9	Russia	522	2.9%	30%	9	South Korea	524	2.9%	23%
10	Belgium	476	2.6%	17%	10	Hong Kong, China	511	2.8%	16%
<b>11</b>	<b>UK</b>	<b>473</b>	<b>2.6%</b>	<b>17%</b>	11	Canada	462	2.5%	15%
12	Hong Kong, China	456	2.5%	14%	12	Belgium	461	2.5%	17%
13	Canada	452	2.5%	17%	13	India	451	2.5%	29%
14	Singapore	410	2.2%	16%	14	Singapore	366	2%	18%
15	Saudi Arabia	365	2%	45%	15	Spain	362	2%	11%
	<b>World total</b>	<b>18,215</b>	<b>100%</b>	<b>19%</b>		<b>World total</b>	<b>18,380</b>	<b>100%</b>	<b>19%</b>

	Top 15 service exporters	Value (\$ billion)	World share (%)	Annual change (%)		Top 15 service importers	Value (\$ billion)	World share (%)	Annual change (%)
1	USA	578	13.9%	11%	1	USA	391	10.1%	6%
<b>2</b>	<b>UK</b>	<b>274</b>	<b>6.6%</b>	<b>11%</b>	2	Germany	284	7.3%	8%
3	Germany	253	6.1%	9%	3	China	236	6.1%	23%
4	China	182	4.4%	7%	<b>4</b>	<b>UK</b>	<b>171</b>	<b>4.4%</b>	<b>7%</b>
5	France	181	3.9%	11%	5	Japan	155	4.3%	6%
6	India	148	3.6%	20%	6	France	141	3.6%	7%
7	Japan	143	3.4%	3%	7	India	130	3.4%	12%
8	Spain	141	3.4%	14%	8	Netherlands	118	3.1%	12%
9	Netherlands	128	3.1%	11%	9	Italy	115	3.0%	5%
10	Singapore	125	3%	12%	10	Ireland	113	2.9%	6%
11	Hong Kong, China	121	2.9%	14%	11	Singapore	110	2.9%	15%
12	Ireland	107	2.6%	10%	12	Canada	99	2.6%	10%
	Italy	107	2.6%	9%	13	South Korea	98	2.5%	3%
14	Switzerland	96	2.3%	17%	14	Spain	91	2.4%	5%
15	South Korea	94	2.3%	8%	15	Russia	90	2.3%	24%
	<b>World total</b>	<b>4,150</b>	<b>100%</b>	<b>11%</b>		<b>World total</b>	<b>3,865</b>	<b>100%</b>	<b>10%</b>

[Source] Adapted from World Trade Organization (WTO) (2012). *World Trade Report 2012* (pp. 30, 32). WTO: Geneva.

Since 1998, UK trade deficit has been widening for manufacturing goods (*Economist*, 2013a).<sup>2</sup> From 2000 to 2011, the value of UK manufacturing exports grew by 46%, which corresponds to an annual growth of 4% (Figure 2). Over the same period, manufacturing exports from Germany and the Netherlands grew by almost 160%, those from Italy 100%, and those from France and Ireland 65%. The dip between 2007 and 2009 appears to be caused by the recent economic crisis, specifically by the sharp devaluation of the pound sterling at early stages of the crisis.<sup>3</sup>

**Figure 2: Manufacturing exports from the UK and selected EU countries, 2000-2011 (2000 = 100)**



[Source] Authors' calculation based on the WTO international trade database.

The longer term (1980-2010) trend documents a more sustained loss of UK export competitiveness relative to European rivals.<sup>4</sup> In 1980, the UK was essentially on par with

<sup>2</sup> The UK has run a trade deficit since 1986, reaching 3.6% of GDP in 2010. Since the UK is a net exporter of services (a surplus of 3.1% of GDP), the trade deficit is primarily contributed by the deficit of goods trade (a deficit of 6.8% of GDP). Most of the goods traded are manufactures. Similarly, the US and France are also net exporters of services and net importers of goods. In contrast, China, Germany, and Japan are net exporters of goods and net importers of services.

<sup>3</sup> Some UK exports are invoiced in pound sterling, which implies that after devaluation in the short term (before quantity or price adjustments), their value in US dollars or euros sharply declined relative to exports from other countries.

<sup>4</sup> This characterization does not necessarily contradict our previous observation that UK competitiveness improved since the 1980s. Due to policies unleashed since the Thatcher era that promoted and favored services, as a nation UK economic performance measured by productivity and income per capita—relative to

France in terms of manufacturing export volume, while Germany exported roughly twice as much. From the early 1990s onwards, a considerable gap had opened up between UK and French exports, which continuously rose. Meanwhile, German exports rose much faster and reached a volume of 3.7 times that of the UK. Shown in Table 3, among top manufacturing nations, the UK's rankings in terms of gross value added declined from being fourth in 1980 to ninth in 2010 (McKinsey, 2012a). Table 4 shows the UK's rankings in each of the five major manufacturing sectors (McKinsey, 2012a). While the UK fails to make top ten in the energy-/resource-intensive commodities sector, the UK does appear in four of the five other sectors—but barely, almost always at the bottom of top ten.

**Table 3. Top 15 manufacturing nations (based on gross value added), 1980-2010**

	1980	1990	2000	2010
1	USA	USA	USA	USA
2	Germany	Japan	Japan	China
3	Japan	Germany	Germany	Japan
4	<b>UK</b>	Italy	China	Germany
5	France	<b>UK</b>	<b>UK</b>	Italy
6	Italy	France	Italy	Brazil
7	China	China	France	South Korea
8	Brazil	Brazil	South Korea	France
9	Spain	Spain	Canada	<b>UK</b>
10	Canada	Canada	Mexico	India
11	Mexico	South Korea	Spain	Russia
12	Australia	Mexico	Brazil	Mexico
13	Netherlands	Turkey	Taiwan	Indonesia
14	Argentina	India	India	Spain
15	India	Taiwan	Turkey	Canada

[**Source**] Adapted from McKinsey Global Institute (2012a). *Manufacturing the Future: The Next Era of Global Growth and Innovation* (p. 21), November.

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European peers such as Germany and France—did improve (Porter and Ketels, 2003). However, in the specific sector of manufacturing that is our focus, UK competitiveness—relative to Germany, France, and other EU peers—has declined.

**Table 4. World share of top ten countries in five major manufacturing sectors (based on gross value added)**

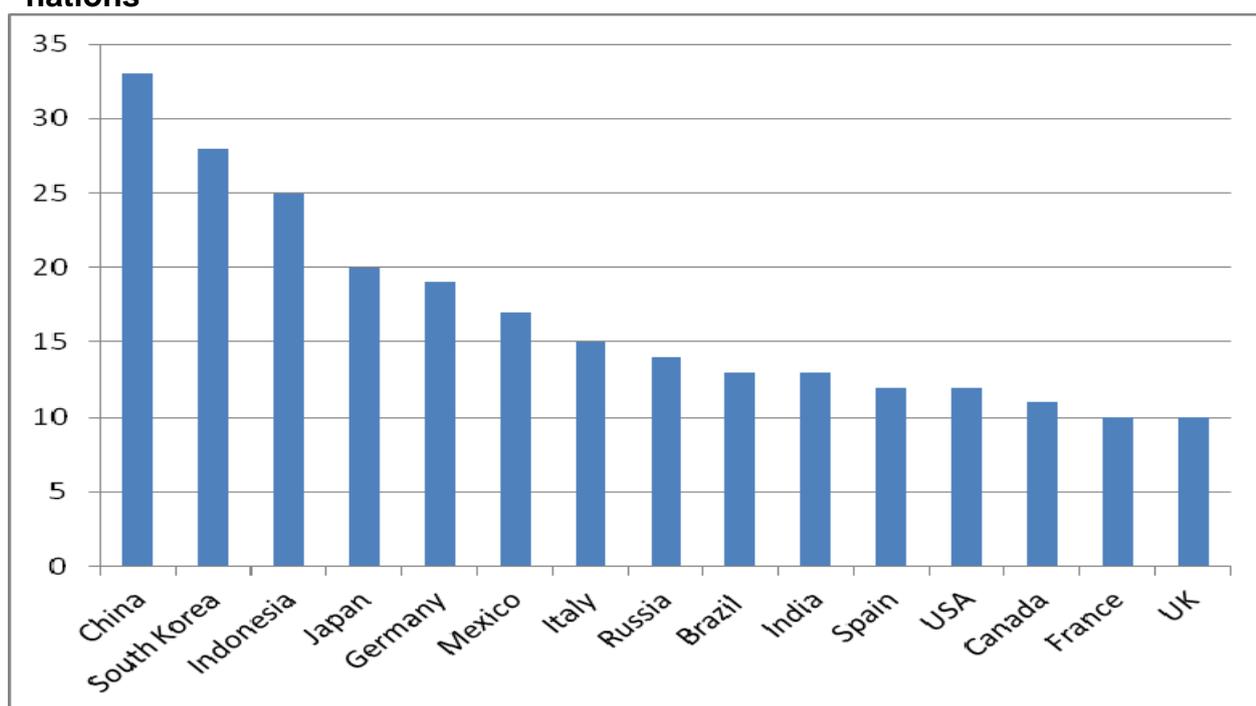
<b>Global innovation for local markets</b> (e.g. automobiles, chemicals, machinery, pharmaceuticals, transport equipment)	<b>Regional processing</b> (e.g. fabricated metals, food and beverages, plastics, printing and publishing, rubber)	<b>Energy-/resource-intensive commodities</b> (e.g. basic metals, minerals, paper and pulp, petroleum, wood products)	<b>Global technologies/Innovators</b> (e.g. computers, electronics, medical equipment, office machinery, semiconductors)	<b>Labor-intensive tradables</b> (e.g. apparel, furniture, jewelry, leather, textiles, shoes, toys)	<b>Overall rankings</b>
1 China (24%)	1 USA (22%)	1 China (29%)	1 USA (27%)	1 China (36%)	1 USA
2 USA (16%)	2 China (18%)	2 USA (14%)	2 China (23%)	2 USA (11%)	2 China
3 Japan (12%)	3 Japan (10%)	3 Japan (10%)	3 Japan (12%)	3 Italy (7%)	3 Japan
4 Germany (9%)	4 Germany (6%)	4 Brazil (6%)	4 Germany (5%)	4 Brazil (4%)	4 Germany
5 Brazil (4%)	5 Brazil (4%)	5 Russia (4%)	S. Korea (5%)	Japan (4%)	5 Italy
6 Italy (3%)	6 France (3%)	6 Germany (3%)	Taiwan (5%)	6 Germany (3%)	6 Brazil
S. Korea (3%)	Italy (3%)	India (3%)	7 Brazil (2%)	7 France (2%)	7 S. Korea
8 France (2%)	<b>UK (3%)</b>	8 Canada (2%)	Italy (2%)	India (2%)	8 France
India (2%)	9 Canada (2%)	Italy (2%)	Switzerland (2%)	S. Korea (2%)	<b>9 UK</b>
<b>UK (2%)</b>	Mexico (2%)	S. Korea (2%)	<b>UK (2%)</b>	<b>UK (2%)</b>	10 India

[Source] Data extracted from McKinsey Global Institute (2012a). *Manufacturing the Future: The Next Era of Global Growth and Innovation* (pp. 21, 45, 52, 56, 59, 62, 66), November. Data refer to 2010.

Shown in Figure 3, among the top 15 manufacturing nations (in terms of gross value added), manufacturing's share of GDP ranged from China's 33% (first) to the UK's and France's 10% (last). The mean was 17% (McKinsey, 2012a).<sup>5</sup>

<sup>5</sup> As countries become richer, manufacturing's share of GDP tends to decrease. The share usually peaks between 25% and 35% (McKinsey, 2012a).

**Figure 3: Manufacturing's contribution (%) to GDP in the top 15 manufacturing nations**



[Source] Adapted from McKinsey Global Institute (2012a). *Manufacturing the Future: The Next Era of Global Growth and Innovation* (p. 24), November. The mean of the top 15 nations is 17% of GDP. Data refer to 2010.

The decline of UK manufacturing export competitiveness is *relative*.<sup>6</sup> It is relative to world trade volumes as a whole and also relative to benchmark countries such as Germany, France, and Italy. In absolute terms, in the decade between 1998 and 2008, the UK increased its goods exports by 72%, to \$468 billion (BIS, 2011c: 7).<sup>7</sup> Such absolute growth was broadly in line with GDP growth. Among manufacturers, exporters generally tend to be more productive (Bernard and Jensen, 1999). Between 1998 and 2008, UK manufacturing industries achieved a 50% increase in labor productivity (PwC, 2009: 1). Experience from the recessions in 1973, 1982, and 1991 suggests that while UK manufacturing output tends to contract during recessions, it grows slowly but steadily afterwards. Overall, manufacturing output expanded in 35 of the 50 years between 1958 and 2008, resulting in a relatively low but apparently sustainable net real growth over the long run (PwC, 2009: 7). This slow growth, however, has been slower than the long term trend of other countries, leading to the decline of the relative standing of the UK in world manufacturing trade.

The decline of UK manufacturing *jobs* is absolute. In 1980, one in four UK jobs was in manufacturing (broadly defined). In 2008, the number went down to one in ten (PwC, 2009: 7). In other words, while output and jobs were reduced during recessions, output rose after recessions primarily due to productivity increase. But most of the lost jobs did

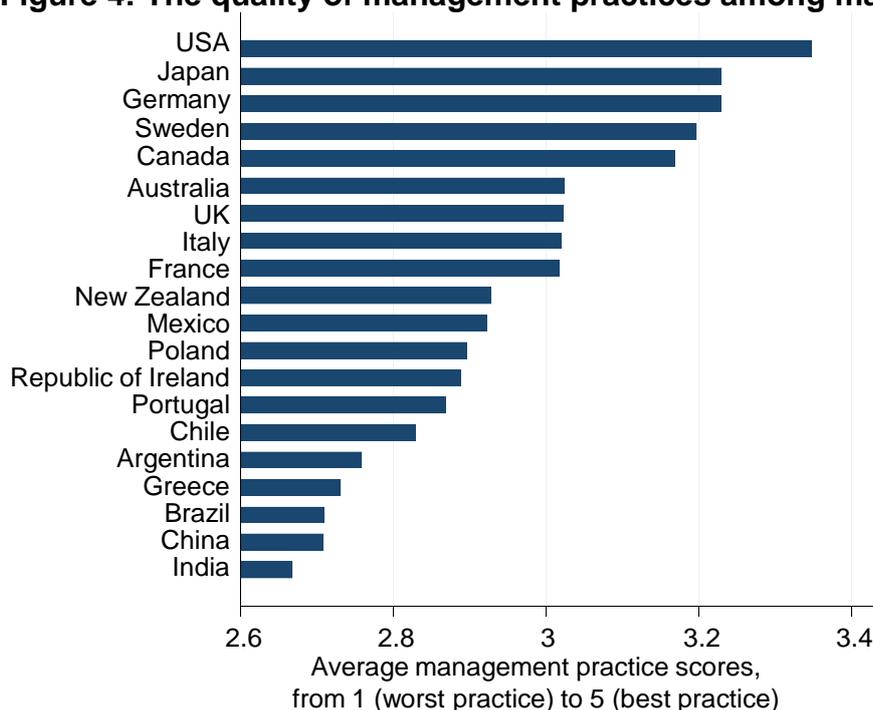
<sup>6</sup> This situation is similar to the experience between 1950 and 1973. This was the “golden age” of European economic growth, during which the UK experienced its *fastest* economic growth in absolute terms (Crafts, 2012: 22). However, this was also a period of the UK’s relative economic decline, as it was overtaken by Germany, France, and other European countries in terms of per capita GDP due to their more rapid growth (Owen, 1999).

<sup>7</sup> All monetary units in this Review are either pound sterling or US dollars.

not come back. In contrast to popular belief, most of the job losses were *not* due to import competition and offshoring. Import competition and offshoring only explain approximately 20% of the job losses, whereas 80% relates to productivity gains and weak demand (McKinsey, 2012b: 17).

There is a tremendous debate regarding the severity of the UK's competitiveness problems. On the one hand, one view suggests that qualitatively, the decline of manufacturing export market share and of manufacturing jobs is not a UK problem per se. Other developed economies experienced similar challenges, thanks to the rise of emerging economies (especially China). In fact, all members of the OECD that joined prior to 1994 (except Turkey) saw their share of world exports decline.<sup>8</sup> In cross-country studies of management quality of manufacturing firms, UK firms do not appear to be particularly badly managed (Figures 4 and 5). Although UK manufacturers fall behind US, Japanese, German, Swedish, Canadian, and Australian rivals in terms of the quality of management practice, they are ahead of Italian and French firms as well as virtually all rivals in emerging economies (Bloom et al., 2012). However, the size of the manufacturing sector has been declining faster than in benchmark countries. This implies that despite highly competitive segments within manufacturing, quantitatively UK manufacturing has been losing export market share relative to other developed economies. Hence, regaining export markets is not only about increasing productivity in existing export sectors, but also in growing these sectors.

**Figure 4: The quality of management practices among manufacturers**



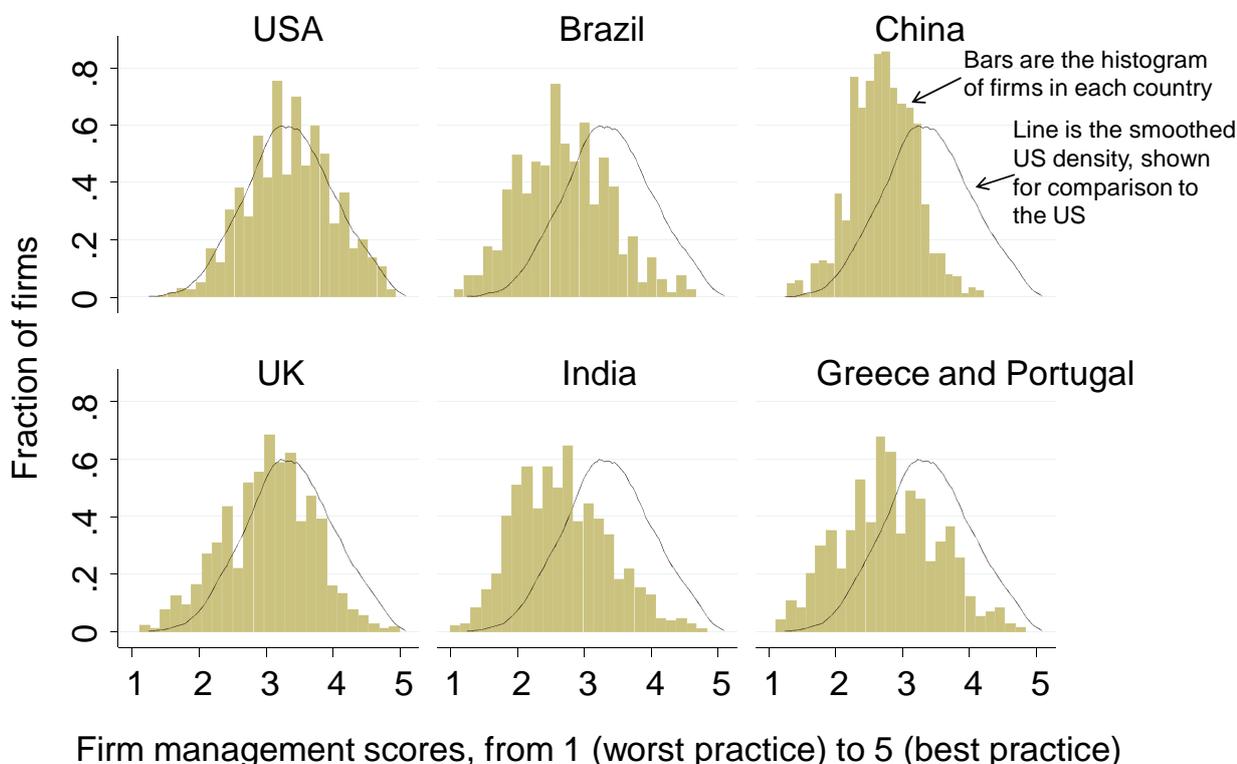
[Source] Adapted from Bloom, N., Genakos, C., Sadun, R. and Van Reenen, J. (2012).

Management practices across firms and countries (p. 18). *Academy of Management Perspectives* February: 12-33. Averages taken across all firms within each country. 9,079 observations in total. Firms were randomly sampled from the population of all

<sup>8</sup> Often regarded as emerging economies, OECD members that joined since 1994—the Czech Republic, Korea, Mexico, Poland, and Slovakia—and Turkey all increased their world share of goods exports (BIS, 2010c: 5).

manufacturing firms with 100 to 5,000 employees. The median firm is privately owned, has approximately 350 employees, and operates two production plants.

**Figure 5: The distribution of UK manufacturers' quality of management practices vis-à-vis global rivals**



[Source] Adapted from Bloom, N., Genakos, C., Sadun, R. and Van Reenen, J. (2012).

Management practices across firms and countries (p. 20). *Academy of Management Perspectives* February: 12-33. 4,930 observations from manufacturing total. See footnote to Figure 4 for details of the survey. The distribution of management quality of UK manufacturers has some resemblance to US firms, except UK firms have a thicker left “tail” of poorly managed firms. In comparison, manufacturers in Southern Europe (Greece and Portugal) and in emerging economies (Brazil, China, and India) have a much thicker left “tail” of poorly managed firms.

UK manufacturing exports' center of gravity as measured by sales remains regional (*not* global) (Rugman, 2005). Shown in Table 5, the EU commands 53.4% of all UK goods exported and is the UK's most important export destination. The US is the largest single country market (13.3%). Overall, UK exports are less focused on other EU countries than its European peers in Table 5, and are more focused on the US than any other country apart from Ireland. Thus, the weak performance of the EU economies, often mentioned in the UK media, is in our view decidedly *not* a reason for the UK's relatively poor export performance, as other countries in Table 5 would have been more adversely affected if that were the case.

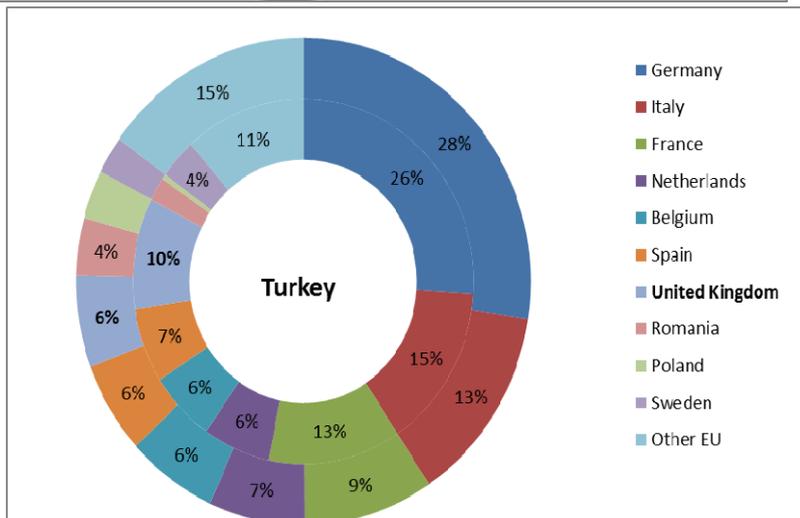
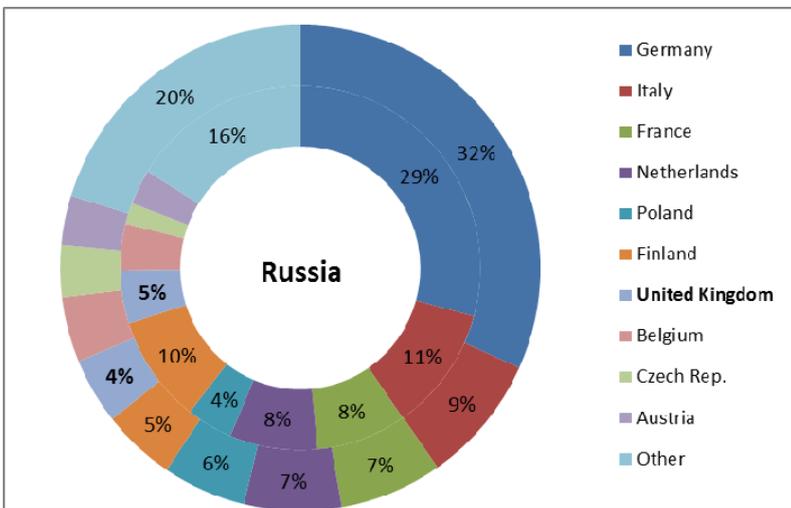
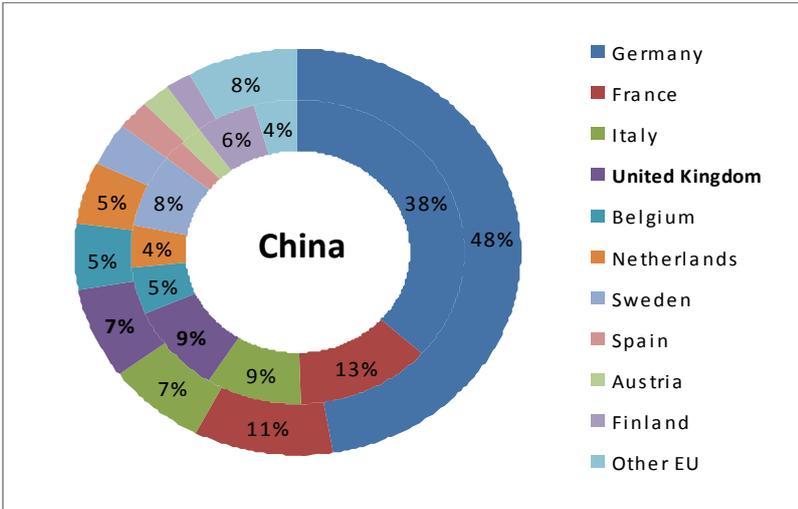
**Table 5. Key goods exports for major European export nations**

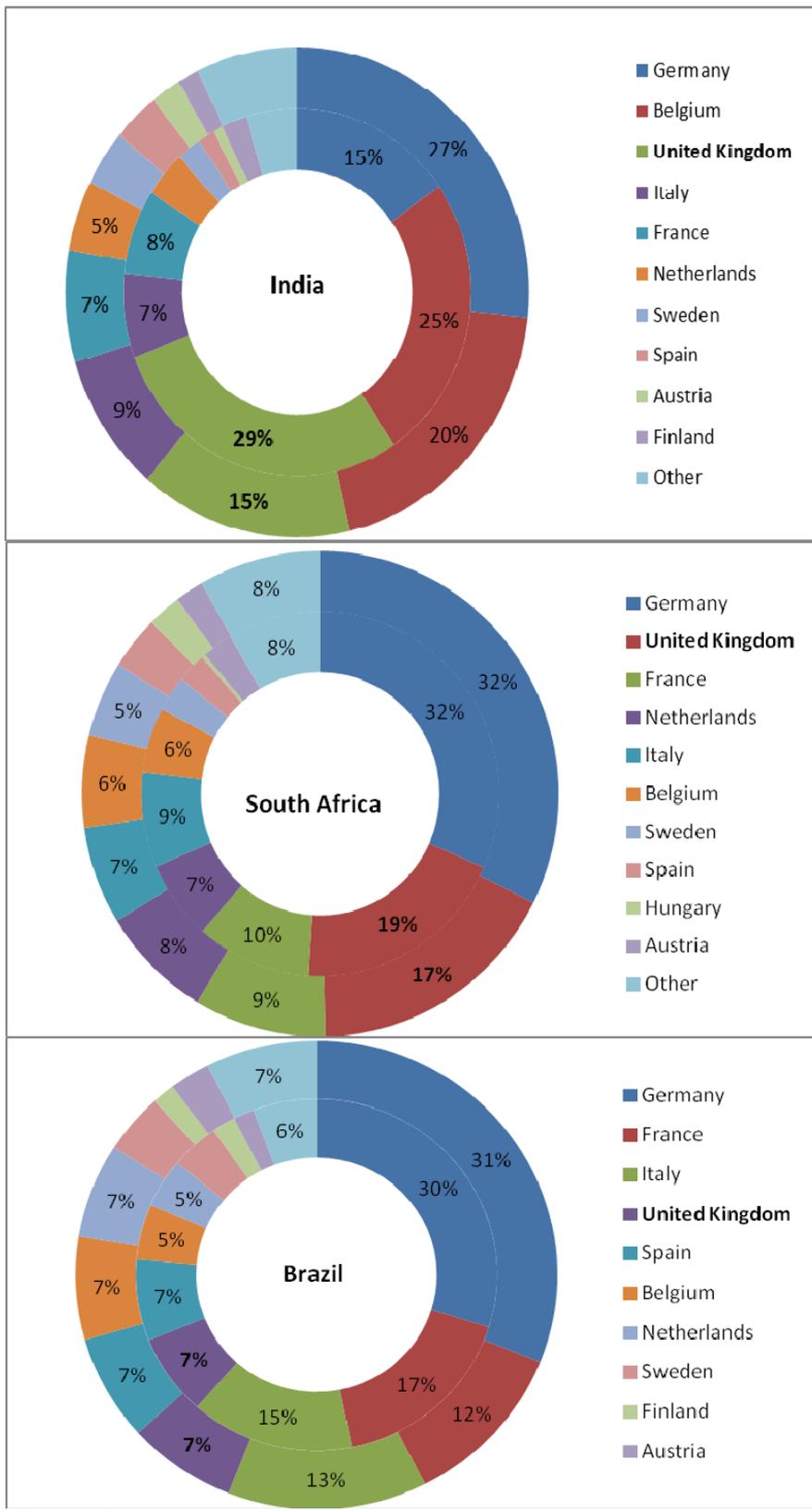
	Value of goods exports, bn USD	Share in world exports	Export growth 2005-2011	Manufactures share in total goods exports	Share of exports (%) to			
					EU	USA	China	Other
Belgium	476.7	2.61%	15%	73.7%	72.2	5.1	2.1	India 2.3
Denmark	113.3	0.62%	15%	64.4%	59.4	5.1	2.2	Norway 6.2
France	596.1	3.27%	9%	76.6%	60.9	5.6	3.2	Switzerland 3.1
Germany	1472.3	8.06%	33%	85.3%	58.2	7.0	6.1	Switzerland 4.5
Ireland	126.9	0.70%	15%	86.1%	57.8	23.1	1.8	Switzerland 4.0
Italy	523.1	2.87%	9%	81.3%	55.4	6.1	2.7	Switzerland 5.5
Netherlands	661.0	3.62%	23%	60.8%	74.1	4.5	1.5	Russia 1.5
Poland	187.4	1.03%	40%	77.9%	77.1	2.0	n.a.	Russia 4.7
Spain	308.7	1.69%	15%	69.5%	66.8	3.5	n.a.	Turkey 2.0
<b>UK</b>	<b>473.2</b>	<b>2.59%</b>	<b>13%</b>	<b>72.1%</b>	<b>53.4</b>	<b>13.3</b>	<b>3.0</b>	<b>India 1.8</b>

[Source] WTO country profiles (<http://stat.wto.org>). Note: n.a. = not in top 5 destinations. Data refer to 2011.

Exports to emerging economies have been a major source of growth. EU exports to BRICS countries (Brazil, Russia, India, China and South Africa) annually grew between 7% and 16% during the 2000-2011 period, starting from a very low level. Although the fast growing economies of China and India are ranked among the top three non-EU destinations in 2011, BRICS collectively bought only 7.7% of all UK exports, up from 3.5% in 2000. China was the most important destination receiving 2.7% of UK exports. The UK contributed 7.2% of all EU exports to China, making the UK the 4<sup>th</sup> largest EU exporter to China. Compared to a decade earlier, emerging economies have risen in their importance for UK exports, but exports from other EU economies have been rising even faster (Figure 6 and Table 6). In response to the 2008 financial crisis, German firms have been particularly successful in expanding their sales to emerging economies (Janssen and Kooths, 2012). Overall, the importance of historical relationships and common language as determinants of trade flows seems to decline, as English is spreading as a *lingua franca* (common language) of business and modern technologies help overcome distance. As part of this broader trend, the UK's relative position in particular in India has been declining (from 29% of all EU exports in 2000 to 15% in 2011).

**Figure 6. EU exports to China, Russia, Turkey, India, Brazil, and South Africa (in descending order of EU export amounts; inner circle = 2000; outer circle = 2011—UK data are in Table 6)**





[Source] Authors' calculations from the Eurostat international trade database.

**Table 6: EU exports to BRICS and Turkey (in descending order of the volume in 2011)**

	China	Russia	Turkey	India	Brazil	South Africa
EU exports (billion euros, 2011)	134.3	108.3	73.0	40.6	35.7	5.2
EU average annual export growth 2000-2011	16.3%	15.3%	7.8%	10.4%	7.1%	13.5%
UK share in EU exports, 2011	7.2%	4.4%	6.1%	14.8%	7.3%	17%
UK rank among EU countries, 2011	4	7	7	3	4	2
Share in UK exports, 2011	2.73%	1.32%	1.23%	1.67%	1.27%	0.72%
UK share in EU exports, 2000	9.2%	4.7%	9.8%	28.7%	7.5%	19%
UK rank among EU countries, 2000	3	6	4	1	4	2
Share in UK exports, 2000	0.77%	0.34%	1.01%	1.27%	0.74%	0.41%

[**Source**] Authors' calculations from the Eurostat international trade database. These data are used to draw the "double donuts" in Figure 6.

In manufacturing, the UK excels in knowledge-intensive, high-tech industries such as pharmaceuticals, aerospace, chemicals, and automobiles. Overall, 25% of the UK goods exports are high-tech, which compares favorably with the US (22%), France (15%), and Germany (11%) (BIS, 2009: 2). In pharmaceuticals, the UK commands a 10% global market share. In aerospace, 6%. In chemicals, 5%. In automobiles, 4% (BIS, 2012a: 37). Compared to benchmark countries, in 2011 pharmaceuticals accounted for a higher percentage of UK exports (10.7%) than any other country, while automotive (13.8%) accounts for a share comparable to that of France (12.4%) but less than that of Germany (19.5%). The product structure of exports also shows major adjustment as electronics products declined sharply.

A simple market share analysis does not reveal the changing nature of UK manufacturing exports, some of which are becoming more competitive. The transformation of the UK automobile industry is a case in point. In 1972, the UK produced under two millions cars, of which only a fifth were exported. In 2011, although total production went down to 1.3 million cars, five out of six (84%) of them were exported. The UK now focuses on making premium cars (such as Bentley, Jaguar, and Rolls-Royce) and exports most of them, while importing most of the basic cars. The *Economist* (2012b) noted that while German automakers continue to do better, UK automakers are "in a much stronger position than [those in] France, Spain, and Italy, which are stuck at the commodity end of car making and sell mainly in the euro zone."

An exclusive (or excessive) focus on exports may underestimate UK competitiveness in overseas markets. This is because the UK has the world's 2<sup>nd</sup> highest level of outward foreign direct investment (OFDI) stock (Table 7). In 2011, the UK possessed \$1.7 trillion (8.2%) of world OFDI stock, which is only behind the US (21.3%) (UNCTAD, 2012: 173). Many UK multinationals engage in significant manufacturing overseas (Driffield et al., 2012). Some of this output is imported back to the UK, which quantitatively contributes to UK trade deficit but qualitatively represents UK strengths. On the other hand, overseas subsidiaries are also a major channel for UK exports of goods (or components of goods assembled and then sold abroad).

**Table 7: The shifting patterns of global FDI stock**

	1980	1990	2000	2010
USA	42.0%	25.5%	33.8%	23.7%
<b>UK</b>	<b>15.3%</b>	<b>13.5%</b>	<b>11.3%</b>	<b>8.3%</b>
Germany	8.2%	8.9%	6.8%	7.0%
France	4.5%	6.5%	11.6%	7.5%
Japan	3.7%	11.8%	3.5%	4.1%
Other developed economies	24.4%	29.9%	21.9%	31.8%
Emerging economies	2.1%	2.6%	4.1%	7.6%
Newly industrialized economies	1.9%	2.2%	6.7%	7.8%
Total	100%	100%	100%	100%

[**Sources**] UNCTAD, *World Investment Report*, 1980 and 1990 from the 1998 edition, and 2000 and 2010 from the 2011 edition. Newly industrialized economies (NIEs) refer to Hong Kong, Singapore, South Korea, and Taiwan. NIEs are reported separately as they arguably have shifted status (from “emerging” to “developed”) during the reporting period.

Overall, a resource-based analysis would argue that UK manufacturers are being severely pressured to look for ways to add *value* to export customers and to craft *rarer* and *harder-to-imitate* products—think of Airbus wings, Roll-Royce engines, and Mini Cooper cars. Firms able to sustainably generate such products require resources that themselves are value-creating, rare, and hard for potential competitors to imitate. The loss of low-end manufacturing processes such as the sewing of garments or the assembly of household electronics can be attributed to their failure to add value (relative to what can be done elsewhere in the world), to their lack of rarity, and to rivals’ ability to imitate.

In addition, an institution-based analysis would add that in the absence of an open trade and FDI environment, export growth would not be possible. For example, the transformation of the British automobile industry (which now exports 84% of output) is facilitated by firms’ ability to take advantage of the open trade and FDI environment, by integrating global and regional value chains. The vast majority of UK-based automakers are now owned by foreign multinationals such as BMW, Ford, GM, Honda, Nissan, Tata, and Toyota. Such an open trade and FDI environment has similarly benefitted the UK aerospace industry, because a significant portion of this thriving industry is also owned by foreign multinationals, such as Airbus UK, AugustaWestland, Bombardier Aerospace (Shorts) Belfast, and Messier-Bugatti-Dowty (SAFRAN).

Two other related questions are: (1) Why is the EU the UK’s most important export destination (absorbing 53% of all UK exports)? (2) Why, despite the hoopla about BRICS, do BRICS only collectively purchase less than 8% of all UK exports? Again, the institution-based view holds a key to these intriguing questions. EU Single Market rules—enshrined in the principles of “mutual recognition for goods” in some sectors and “harmonization through common standards” in other sectors—have been greatly facilitating UK export penetration in the EU. In comparison, lack of such institutions governing market entry into BRICS has so far prevented widespread export penetration there.

Finally, from an institution-based view, informal consumer perceptions and sentiments (conceptually known as informal institutions) play a major role behind the success and

failure of UK manufacturing exports. On the one hand, UK manufacturing is held in high regard among some customers. For example, many overseas customers who buy Land Rovers and Minis “want them to be made in Britain” (*Economist*, 2013a: 58). On the other hand, the widespread discussion of the “decline of UK manufacturing”—not only by managers, journalists, and officials elsewhere but also by those in the UK—may have resulted in a self-fulfilling prophecy. *On the margin*, such unfavorable sentiments may lead potential export customers to pick rival products over British offerings. Of course, this informal institution-based effect is hard to quantify. But it certainly exists. Overall, managers need to be advocates for their firm and industry. It is advisable to talk up their firm’s contributions and make sure the widest possible audience is aware of these achievements. This will not only help win export customers, but will also counteract common misconceptions domestically within the UK so that manufacturing industries can attract the best talent.

In summary, our view is that UK manufacturing is neither dead nor in terminal decline. The sector survived the crises of 1973, 1982, and 1991, and will likely survive the current downturn. While it has been losing jobs, its value-added and productivity have been growing in absolute terms. Its shrinking world market share is a reflection of both (1) the more rapid “rise of the rest” (namely, emerging economies) and (2) the more effective competitive responses of some of UK firms’ traditional competitors (such as German firms), thus necessitating UK firms’ efforts to enhance the value, rarity, and inimitability of their offerings and the Government’s initiatives to enhance UK competitiveness.

## 4. A decade from now: the view to 2025

### 4.1. The great transformation

The Great Transformation of the global economy is embodied by the tremendous shift in economic weight and engines of growth toward emerging economies in general and BRIC in particular (Goldman Sachs, 2011b). Led by Jim O’Neill who coined the term “BRIC,”<sup>9</sup> Goldman Sachs (2005) predicted that by 2025, the top 15 economies in terms of GDP—in descending order—will be the US, China, Japan, Germany, India, the UK, France, Russia, Korea, Italy, Mexico, Brazil, Canada, Indonesia, and Turkey. In addition to BRIC, another group of increasingly important emerging economies is the Next Eleven (N-11)—Bangladesh, Egypt, Indonesia, Iran, Korea, Mexico, Nigeria, Pakistan, Philippines, Turkey, and Vietnam (Goldman Sachs, 2005). While groupings such as BRIC and N-11 are always arbitrary, they serve a useful purpose—namely, highlighting their economic and demographic scale and trajectory that enable them to challenge developed economies in terms of weight and influence in the global economy. The relatively less well-known N-11 is a diverse group, ranging from higher income, more developed OECD members (Korea and Mexico) to lower income, politically uncertain countries (Egypt and Pakistan). Even with the more recent addition of the N-11, BRIC countries remain the foundation of the Great Transformation due to their sheer scale and trajectory both economically and demographically (Goldman Sachs, 2005).

Of course, the Great Transformation is not a linear story of endless and uniform high-speed growth. All BRIC economies have experienced some slow down recently. There is a view that such growth may not be as fast as Goldman Sachs (2005, 2010, 2011a, 2011b, 2012), HSBC (2011), OECD (2012), and many others have predicted (Sharma, 2012). Overall, it seems that emerging economies *as a group* are destined to grow both their absolute GDP and their percentage of world GDP relative to developed economies. The debate centers on how much and how fast (or how slow) such growth will be.

In the past two to three decades, emerging economies have not only become major markets, but also locations for offshored production and for low-cost competition. However, recent analysis suggests that this trend is slowing down or, especially in the USA and the UK, reversing.<sup>10</sup> The reasons are:

- wages rising much faster in China and India than in the USA and the UK.
- firms experiencing coordination and quality control issues regarding offshored operations.
- rising cost of fuel making it less economic to ship goods over a long distance.

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<sup>9</sup> In Section 3, we have used a more recent term “BRICS,” which not only refers to Brazil, Russia, India, and China, but only includes South Africa. In this section, because we extensively draw on the work of Jim O’Neill and his colleagues at Goldman Sachs, we follow their convention to refer to the four original countries (but not South Africa) when using the term “BRIC.”

<sup>10</sup> In continental Europe, the original offshoring trend has been less strong, and thus less reversal is currently observed. However, a powerful trend in continental Europe has been “nearshoring”—locating production activities in nearby countries exploiting the variation of skills within the EU or within its vicinity in Central and Eastern Europe or North Africa (Deutsche Bank, 2006). Consequently, Europe is also benefitting less from the reversal of offshoring—also known as reshoring—that has recently been observed especially in the US (*Economist*, 2013c).

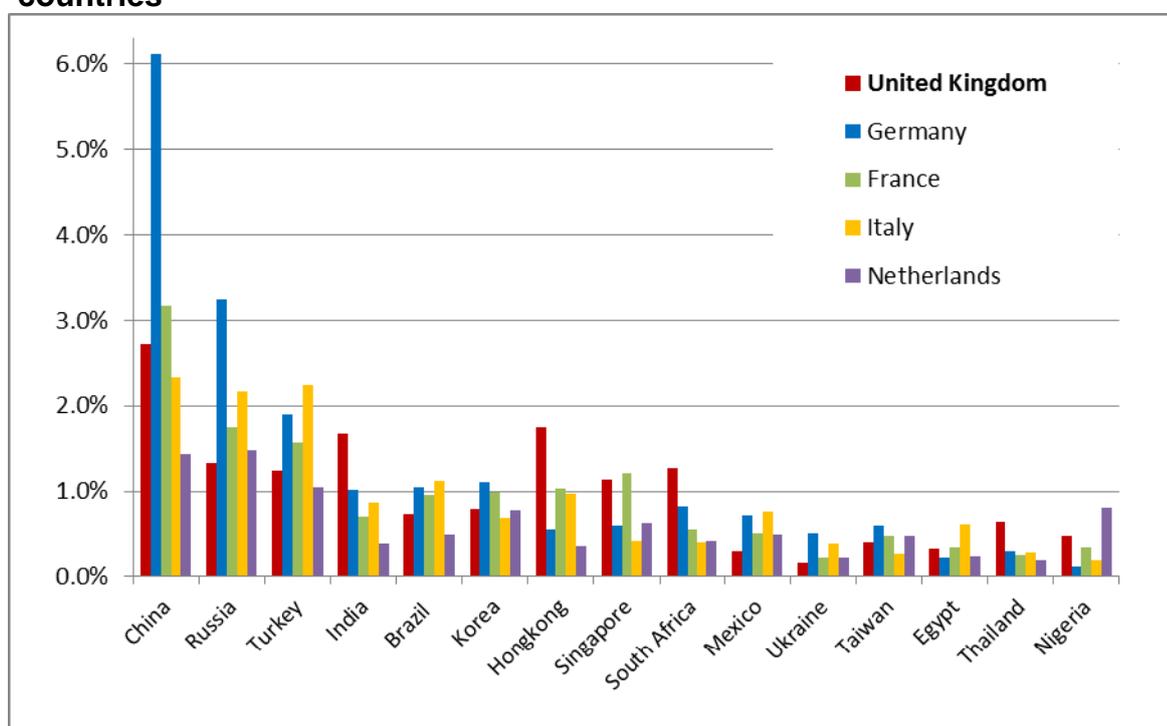
- new manufacturing technologies enabling firms in developed economies to employ fewer but more highly skilled workers.

Looking forward, we expect the location of manufacturing production to become more dynamic, and hence the patterns of comparative advantages swing more frequently than they did in the past. How much of the Great Transformation will translate into (hopefully expanding) market share for UK manufacturing? Forecasting what will happen a decade from now with a view to 2025, we can start by investigating how UK manufacturing exports are positioned currently.

## 4.2. How are UK manufacturing exports positioned in the fast growing markets?

In a nutshell, not well overall. Emerging economies play an increasing but still small role for most EU countries including the UK (Figure 7). On average, EU countries send 3.1% of their exports to China and 2.5% to Russia. Among emerging economies, the third biggest EU export destination is Turkey. India and Brazil are the 4<sup>th</sup> and 5<sup>th</sup> largest EU export markets, respectively, among emerging economies. In terms of percentage of exports going to emerging economies among all exports, the UK trails behind Germany in a majority of these fast-growing markets. Exceptions are Hong Kong, India, Singapore, South Africa, and Thailand, which buy a higher percentage of imports from the UK than from Germany—evidently due to historical ties.

**Figure 7. Exports to emerging economies (%) among all exports for selected EU countries**

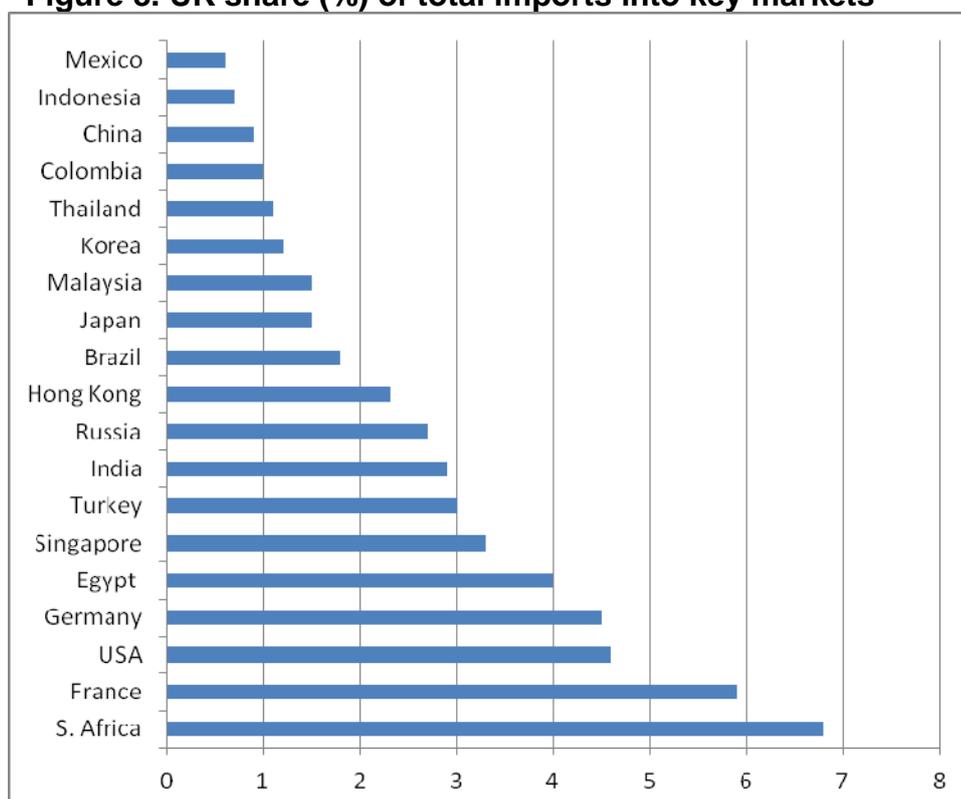


[Source] Authors' calculations based on the Eurostat international trade database. Data refer to 2011.

Using UN data quoted in BIS (2012b), Figure 8 illustrates the UK share of total imports among key markets. The UK has an enviable 6.8% market share in South Africa. But in BRIC, the UK import market share is *below* the UK's share of world exports (3.3%). In the crucial China market, the UK only commands a 0.9% import market share, making it the

24<sup>th</sup> largest exporter to China (and the 4<sup>th</sup> EU exporter to China). In India, the UK is the 21<sup>st</sup> largest exporter (and the 3<sup>rd</sup> largest EU exporter). Using Russian statistics (Goskomstat), we find that the UK is the 13<sup>th</sup> largest goods exporter to Russia with a relatively low 2% import market share (see Box 1). Given that the UK is the world's 11<sup>th</sup> largest goods exporter (with a 2.6% world share), the UK's export performance in China and Russia is particularly disappointing. Put it another way, there is tremendous room for growth in China, India, and Russia—as well as in Brazil, Indonesia, Mexico, and other emerging economies where the UK currently has a lackluster export performance.

**Figure 8. UK share (%) of total imports into key markets**

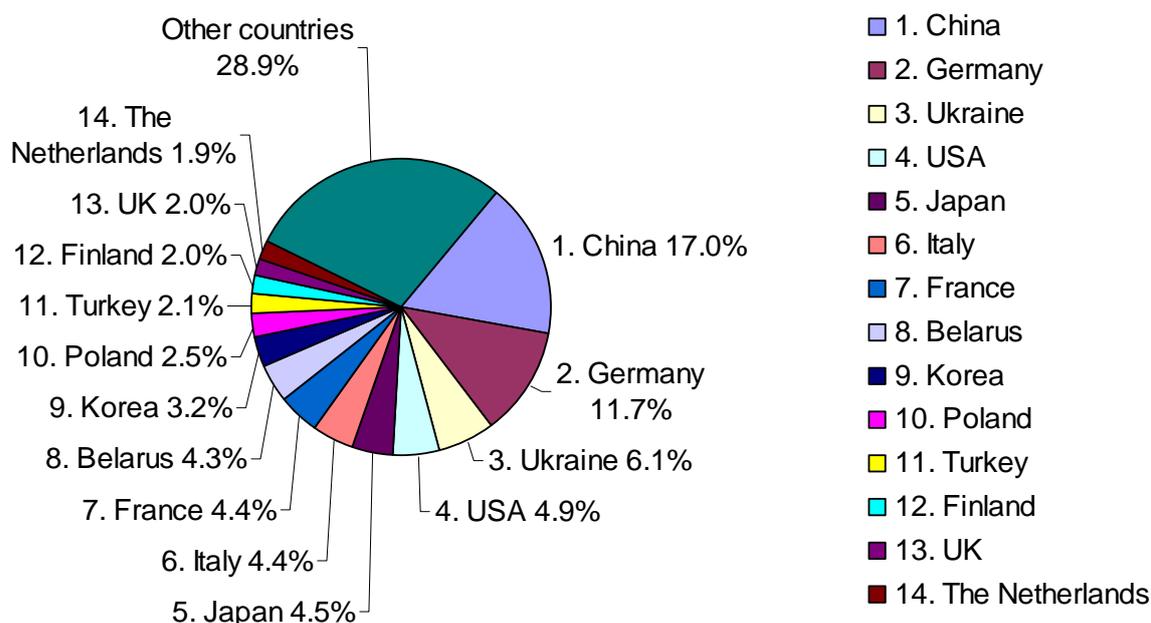


[Source] Adapted from BIS (2012b). UK trade performance across markets and sectors (p. 8). *Economics Paper 17*, Department for Business, Innovation and Skills: London. The underlying data are from the UN. Data refer to 2010, during which the UK share of global exports (goods and services) was 3.3% and the UK share of goods exports was 2.6%.

### Case Study Box 1: UK Exports in Russia

Russia is the richest emerging economy (by per capita income). Among its BRIC peers, Russia is also the geographically closest country from the UK. A standard gravity model in international economics would have predicted relatively higher UK export sales in Russia. Yet, among BRICS, UK exports (or, viewed from Russia, UK imports) command a very low market share (Figure 6 and Table 6). The total value of UK manufacturing imports in Russia in 2011 was \$7.2 billion, which accounted for just 2% of Russia's goods imports. The UK thus was not only behind its usual global rivals and Russia's "near abroad" (post-Soviet) neighbors (such as Ukraine and Belarus) that naturally trade a lot with Russia, it was also behind Korea, Poland, and Turkey. However, Russia is one of the fastest growing markets for UK exports. UK exports to Russia in 2011 increased by 39% from 2010. Since 2001, UK-Russia trade has been growing by an average of 21% year-on-year rate.

**Figure Box 1.1. Russia's goods imports by country**



[Sources] Goskomstat, [www.gks.ru](http://www.gks.ru); [www.ved.gov.ru/exportcountries/gb/gb\\_ru\\_relations/-gb\\_ru\\_trade](http://www.ved.gov.ru/exportcountries/gb/gb_ru_relations/-gb_ru_trade). Data refer to 2010.

Clearly, the room for growth is tremendous. For example, the Russian government is committed to developing its automotive industry and car sales went up 15% last year. For UK firms that tap into this market such as industrial measurement (metrology) equipment producer Renishaw, the opportunities already turned into profits. In Russia, Renishaw enjoyed a 20%-30% growth in sales between 2010 and 2011, and further double-digit growth was predicted. Russia belonged to a core group of emerging markets with high growth that the firm hoped to balance against big traditional markets in the West with low growth.

If there is British technology not yet developed or sold within Russia, Rydian Pountney, general manager of ROW sales at Renishaw and board member on UK Trade and Investment's (UKTI's) Advanced Engineering Sector group, recommended that UK firms enter to fill the gap. It is important to note that Russia is *not* a price-sensitive market. Quality means everything to Russians who tend to look at the technical aspects of a product more than the cost and are willing to pay for a better product. Renishaw was able to maintain its margins in Russia as people were willing to pay for quality not just at the point of sale, but throughout the life of a product. Therefore, selling on price is generally not advised. However, tariff reductions associated with Russia's WTO membership, effective August 2012, would typically bring down the price of manufacturing imports by 10%, making them more affordable to Russian customers.

[Sources] Based on (1) *The Manufacturer*, 2012, Russian opportunities as it finally joins WTO, August 22, <http://www.themanufacturer.com/articles/russian-opportunities-as-it-finally-joins-wto/>; (2) *The Manufacturer*, 2012, To Russia, with love, May 4, <http://www.themanufacturer.com/articles/export-focus-to-russia-with-love/>; (3) UK Trade and Investment, 2013, Russia, <http://www.ukti.gov.uk/export/countries/europe/easterneurope/russia.html>.

While research on competition unfolding in emerging economies is rapidly expanding (Hoskisson et al., 2013; Wright et al., 2005; Xu and Meyer, 2013), not a lot is known about the drivers of export performance. What are the main factors shaping consumer and business demand in these emerging economies? Innovation, value for money, quality, and delivery to specification have emerged as main criteria in a comparative survey of customers in China, India, and the USA by RSM (2010, quoted by BIS, 2011a: 106). Products from the USA are generally perceived as strong in innovation, and those from Germany and Japan are often viewed as competitive in value for money, quality, and delivery. Exports from the UK are typically viewed as weaker than leading suppliers. (Exports from France are viewed as weaker than those from the UK.) Overall, US customers have the most positive perceptions of UK exports, and Chinese customers the least positive (Box 2). Indian customers are only slightly more positive than Chinese customers (RSM, 2010).

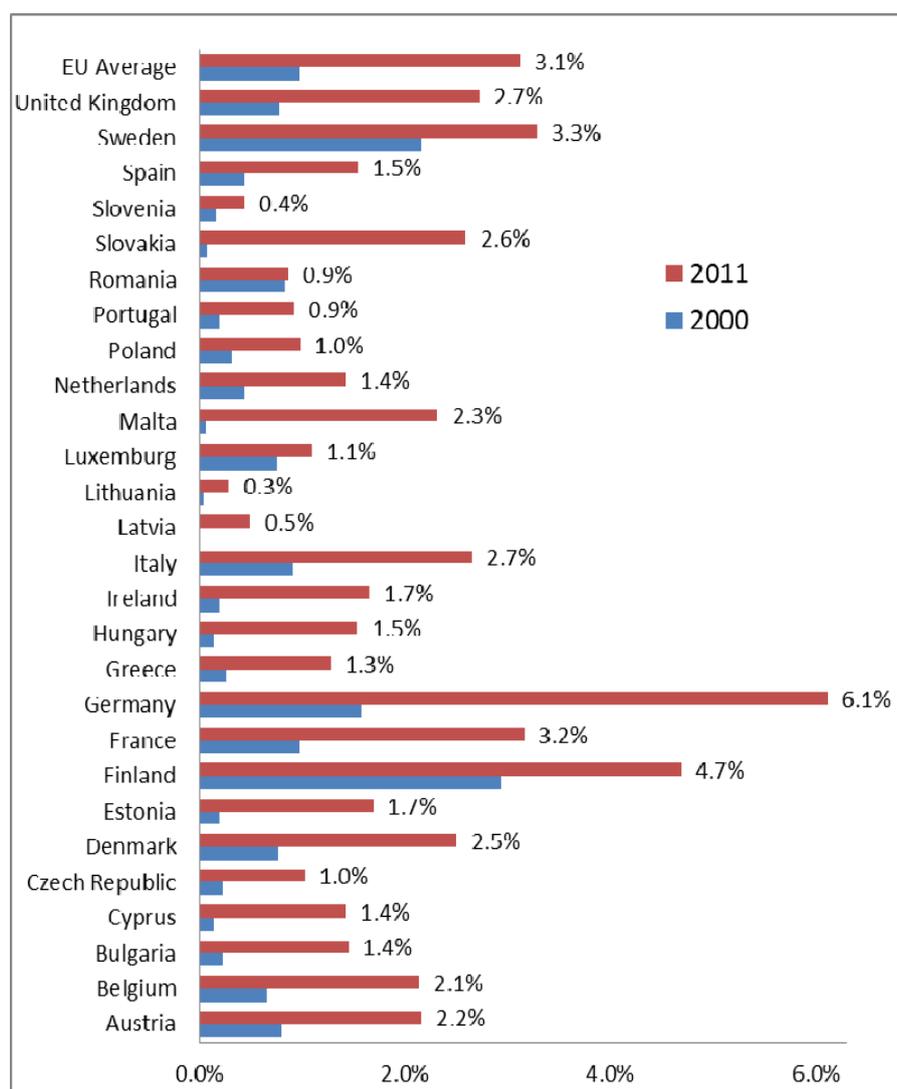
### **Case Study Box 2: UK Exports in China**

By 2020, China is likely to be responsible for \$5.5 trillion of the estimated \$14.5 trillion value of consumption in eight of the large emerging economies (each of which would have a GDP that is larger than 1% of global GDP): BRIC, Korea, Indonesia, Mexico, and Turkey. Not surprisingly, many firms from the EU have increased their exports to China. Figure 2.1 illustrates that China's share among exports in all EU countries jumped threefold in one decade: from less than 1% in 2000 to 3.1% in 2011. Correspondingly, in the UK the growth of China-bound exports increased from 0.8% in 2000 to 2.7% in 2011.

UK and EU firms of course are not the only competitors in China. Using data from Chinese customs, we have investigated the main countries of origin of manufacturing imports into China. As a group, the EU is the largest source of imports with \$212 billion, followed by ASEAN countries as a group with \$196 billion. The largest individual countries are, respectively, Japan (\$178 billion), Korea (\$169 billion), the USA (\$133 billion), and Taiwan (\$132 billion), underlining the fact the geographic proximity is still a substantive factor in international trade. If EU and ASEAN countries are considered separately, in 2011, Germany came fifth as a source of Chinese imports (\$93 billion), France 20th (\$20 billion), and the UK 24th (\$14 billion). Both Russia (10th) and Switzerland (16th) were ahead of the UK.

What do Chinese customers want from UK and other EU exports? Our interviews in China during 2012 and 2013 suggest that the bottom line is that Chinese firms import from the EU primarily in the high-end technology space, especially the biggest machines and most sophisticated technology-based products—standard products they can increasingly produce themselves. Moreover, Chinese consumers value important high-end brands. The French and the Italians seem to have done a better job in getting their fashion brands into consumers' minds, while the Germans and the Swiss are known for reliable technologies. The UK on the other hand is just not as recognized for either technology or fashion—notwithstanding important exceptions (such as Burberry, Dunhill, and Rolls-Royce). In other words, the value proposition embedded in most UK exports may not be compelling in the eyes of Chinese customers. As China enters an era that is based on the quality of growth as opposed to the quantity, how to capture the consumption of middle income groups and mid-tier firms that aspire to do better in their respective domains will be a leading challenge for exporters eyeing the hearts, minds, and wallets of these consumers.

**Figure Box 2.1: Share of EU members' national exports going to China, 2000 and 2011**



[Source] Authors' calculations based on the Eurostat international trade database.

[Sources] Based on (1) authors' interviews of executives and consumers in China, December 2012 and January 2013; (2) authors' interview of Jim O'Neill (Chairman, Goldman Sachs Asset Management), December 2012; (3) Chinese customs database; (4) Eurostat international trade database.

### 4.3. How can UK firms do better and win? A resource-based view

From a resource-based standpoint, focus on value, rarity, and inimitability (VRI) attributes. As the distinction between manufacturing and services blurs, value may not necessarily be found in manufacturing per se, but in the smart *combination* of manufacturing and services. For example, Rolls-Royce has transformed itself from a pure engine manufacturer to an integrated service provider that rents airlines the engines, monitors the engines 24/7, and carries out full maintenance.<sup>11</sup>

<sup>11</sup> More than half the engines manufactured by Rolls-Royce are now sold with such a service contract.

Value may also be captured by rapidly developing technologies advanced by UK entrepreneurs such as information technology, biotechnology and green energy, and additive manufacturing (3-D printing), which enables faster, more flexible, and less expensive manufacturing of products on a small batch basis. Such developments may erode the low cost advantage of China-based manufacturing, and may result in stronger regional value chains within Europe (McKinsey, 2012a; Rugman, 2005). These developments may lead to some manufacturing revival in the UK.

Using high levels of design and engineering skills to produce technologically complex products and processes, advanced manufacturing seems particularly promising. For example, the global market for plastic electronics (also known as printable electronics) is estimated to be £125 billion by 2025. The global market for industrial biotechnology may reach between £150 billion and £360 billion by 2025. The future value of the UK market for composites (especially carbon fiber-based composite materials) may be at least £20 billion (BIS, 2009: 6-7). In these high technology sectors, it is not only established firms that aspire to reach global markets. Many entrepreneurs in fact start up their firms with a vision of globally integrated value chains and target customers around the world (Meyer and Xia, 2012).

However, it is important to note that UK firms' quest for resource-based advantages centered on VRI dimensions is not limited to high-tech or advanced manufacturing per se. Box 3 illustrates the recent strategic transformation at Burberry, by enhancing the value, rarity, and inimitability of its traditional offerings. In an era of outsourcing, the firm has discovered that a *Designed-in-UK* and *Made-in-UK* Burberry trench coat is tremendously valuable, rare, and virtually impossible to be imitated by rivals. This new strategy has enabled Burberry to add 1,000 UK jobs in the last two years. The essence of such a strategy is the creation of intangible value in the eyes of (potential) consumers worldwide of products associated with the UK's positive country-of-origin image. In other words, focusing on V, R, and I can enhance UK manufacturing competitiveness, even in a UK industry that has long been declared to have lost its global competitiveness (garments).

### **Case Study Box 3: Enhancing value, rarity, and inimitability at Burberry**

Asked to name an iconic British luxury brand, most people would probably nominate Burberry. Founded in 1856, Burberry grew to become a leading global fashion house with £3.5 billion revenue in 2012. Most famous for its trench coats worn by soldiers in the trenches during WWI, Burberry became such a part of British culture that it earned a royal warrant as an official supplier to the royal family.

However, by the mid-2000s, Burberry lost its focus. It had 23 licensees in a variety of products and locations around the world, each doing something different ranging from dog cover-ups and leashes to kilts. In luxury, ubiquity by definition is the killer of exclusivity. Among numerous Burberry products, outerwear exemplified by the "boring old trench coat" only represented 20% of its global revenue. While luxury sales were growing globally, Burberry seemed to be losing out, with a lackluster growth rate of only 2% per year by 2006. Each of Burberry's two leading global rivals (LVMH and Gucci) had more than ten times of Burberry's revenue and much higher growth. How could Burberry, which became a "David," grow against such "Goliaths"?

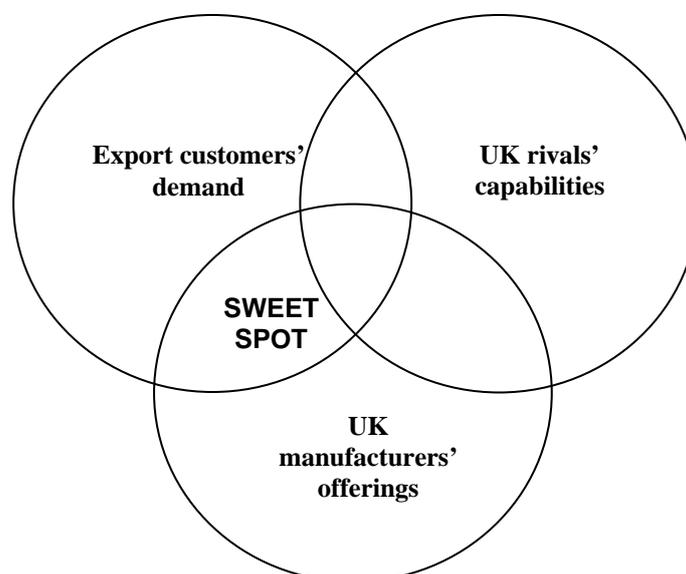
In 2006, with the arrival of the new CEO Angela Ahrendts, significant soul searching took place at Burberry. Deploying the classic resource-based logic (especially the value-rarity-inimitability [VRI] framework), the firm realized that its greatest assets lied in its *Britishness*, more specifically its trench coat roots—hence the highest value it could deliver. Further, such a focus on Britain’s positive country-of-origin image would be rare in a world largely populated by French and Italian luxury brands. It would also be difficult (or sometimes impossible) to imitate if this heritage were emphasized and strengthened.

With this powerful insight, Burberry adopted a new strategy centered on the iconic trench coat—its first social media platform was named [www.artofthetrench.com](http://www.artofthetrench.com). Before the transformation, Burberry sold just a few styles of trench coats and almost all were beige with the signature check lining. Now with centralized and consistent design (a significant intangible capability), it sells more than 300 SKUs in a wide variety of styles and colors related to trench coats. By 2012, 60% of its revenue came from apparel, and outerwear made up more than half of that. Many of its stylish trench coats are priced over \$1,000. Further, instead of outsourcing, Burberry has concentrated its trench coat production at the Castleford factory in the north of England, adding more than 1,000 jobs in the UK in the last two years alone (of a global labor force of 9,000). In summary, a Burberry trench coat *designed and manufactured in the UK* is valuable, rare, and impossible to imitate by rivals. The upshot? Burberry has been rewarded handsomely by the market. In five years (2007-2012), its revenue and operating income doubled. In 2011, Interbrand named it the fourth fastest-growing global brand (behind Apple, Google, and Amazon) and the fastest-growing luxury brand.

[**Sources**] Based on (1) A. Ahrendts (2013), Burberry’s CEO on turning an aging British icon into a global luxury brand, *Harvard Business Review* January-February, 39-42; (2) M. W. Peng (2014), High fashion fights recession, in M. W. Peng, *Global Strategy*, 3<sup>rd</sup> ed. (57-59), South-Western Cengage; (3) [www.artofthetrench.com](http://www.artofthetrench.com); (4) [www.burberry.com](http://www.burberry.com).

Overall, a resource-based view suggests that UK manufacturers’ future performance lies in whether they can find a *strategic sweet spot*, which is in demand by export customers, not available to UK rivals, and competently (and hopefully exclusively) provided by UK firms (Figure 9). This will not be easy but—as evidenced by Burberry’s success—not impossible.

**Figure 9: UK manufacturing: The search for strategic sweet spot**



## 4.4. How can UK firms do better and win? An institution-based view

A key proposition of the institution-based view is that institutions matter (North, 1990; Peng et al., 2009). How do institutions matter? This section discusses three areas that directly impact UK manufacturing exports: (1) UK trade, (2) inward FDI into the UK, and (3) outward FDI from the UK.

The first institution-based dimension is with respect to UK trade. The fact that the lion's share of UK exports goes to the EU is driven by both (1) geographic proximity and (2) the EU's Single Market institutions. UK trade with the EU currently brings about £2,000 to every British household a year. However, UK trade with the EU is far from reaching its potential due to the remaining trade barriers. BIS (2011a) estimated that UK trade with the EU is running 45% *below* potential. Should the remaining intra-EU trade barriers be completely removed, each UK resident would enjoy a 7% increase in income and each UK household would pocket £4,300. Moreover, UK exports to non-EU destinations often use imported parts or components through regionally integrated (intra-EU) value chains. Thus, even exports to non-EU countries indirectly benefit from free trade within the EU.

Likewise, the UK's relatively low market share penetration in some of the fastest growing economies—in addition to the resource-based (and product-specific) problems noted in the previous section—can be attributed to (1) the geographic distance and (2) the continued existence of institution-based hurdles (such as trade barriers and host government discrimination).

Geography cannot change. But formal institutions can—as long as there is sufficient political will. One of the most significant debates in the UK currently is whether the UK gains or loses more by staying within the EU. Looking out a decade from now (up to 2025), we predict:

- **Prediction 1:** The bulk of UK manufacturing export markets will continue to be in the EU by 2025.
- **Prediction 2:** Should the UK exit the EU, the resulting economic losses due to higher trade barriers that the EU members will impose on the UK (either as a non-member or a non-fully-integrated member at that time) cannot be compensated by the increase of exports to emerging economies such as BRIC. In most of these economies, the UK manufacturing exports currently have a very small market share and face very strong competitors.
- **Prediction 3:** While UK exports to China will grow, the UK will not become a significant (top ten) exporter to China by 2025. The UK currently has a very low (0.9%) import market share, ranking *behind* 23 countries. While China is predicted to become the world's largest economy by 2027 (Goldman Sachs, 2011b), the growth of Chinese demand is likely to be captured by the current leaders in manufacturing exports to China—(in descending order) Japan, Korea, the USA, Taiwan, and Germany.
- **Prediction 4:** The UK—together with the EU—will benefit from more free-trade agreements (FTAs) with more countries, especially with some fast-growing emerging economies and with the USA. These FTAs can follow the very first FTA that the EU entered with an Asian country: the EU-South Korea FTA that became effective in July 2011 (Byles, 2014). Although South Korea is the world's 9<sup>th</sup> largest goods importer (Table 2), it only absorbs 2%–2.5% of total extra-EU trade. Since virtually all (98.7%)

customs duties on manufactured goods will be removed within the first five years of the FTA, UK manufacturing exports to Korea will grow.

A second institution-based aspect deals with the dynamic relationship between manufacturing exports and *inward* FDI. Thanks in part to the UK's open, fair, and competitive institutions governing the FDI environment, the UK outperforms every other country in the EU in attracting inward FDI. The upshot? Foreign multinationals—via inward FDI—now account for approximately half of UK manufacturing output and 40% of service output (BIS, 2011a: 22).<sup>12</sup>

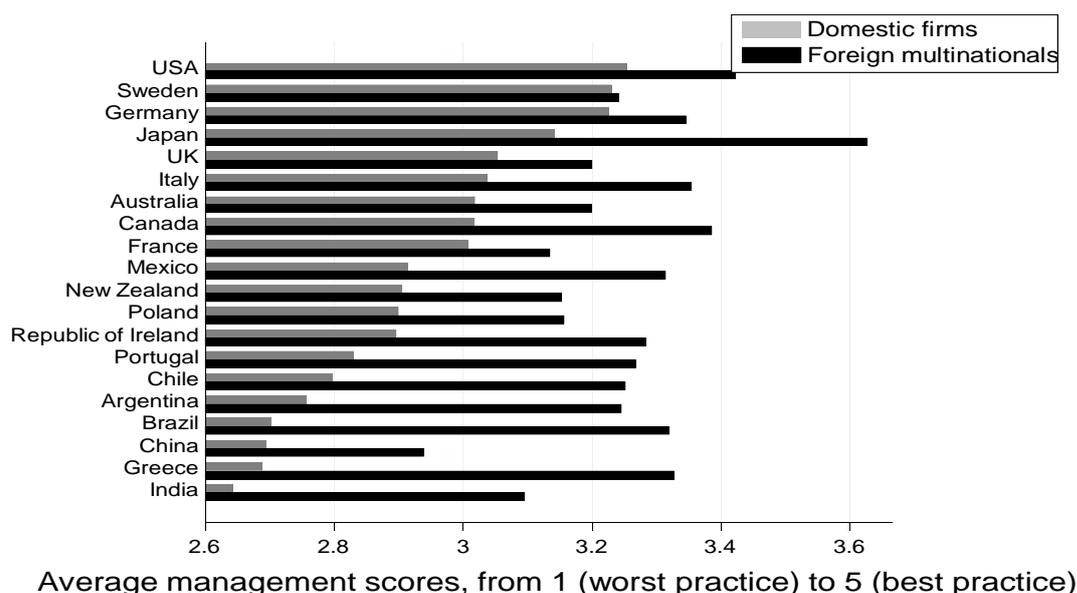
While around the world there is a tremendous debate on whether FDI generates positive spillovers, in the UK the weight of evidence is clearly in favor of the net *positive* contributions of inward FDI (Driffield and Love, 2007; Haskel et al., 2007; Liu et al., 2000; Meyer and Sinani, 2009). For every UK job that is lost due to inward FDI, five more jobs are added—a net gain of four UK jobs (BIS, 2011a: 25). Today, UK manufacturing exports are primarily generated by (1) UK-owned firms and (2) non-UK firms headquartered in developed economies that have undertaken FDI in Britain (e.g. BMW, Honda, and Nissan). We envision that by 2025, there will be a third significant group of UK exporters: (3) non-UK firms headquartered in emerging economies that invest and produce in Britain (Hoskisson et al., 2013; Peng, 2012; Sun et al., 2012). For example, Tata, with 45,000 employees, is now the *largest* private-sector employer in the UK and exports a great deal from the UK to India and beyond.

Shown in Figure 10, foreign multinationals in the UK and elsewhere are generally better managed than domestic firms (Bloom et al., 2012). This makes sense since by self selection, only the stronger and more productive firms would choose to undertake FDI, which is inherently risky (Meyer et al., 2009; Peng and Meyer, 2011). Therefore, it seems imperative that the UK maintain an open environment for inward FDI, which will translate into significant exports.

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<sup>12</sup> Foreign multinationals' shares in gross value added and employment are lower, due to their greater use of outsourced inputs and their concentration on relatively low labor-intensity activities (BIS, 2011a: 22).

**Figure 10: Foreign multinationals in the UK and elsewhere are better managed than domestic firms**



[**Source**] Adapted from Bloom, N., Genakos, C., Sadun, R. and Van Reenen, J. (2012). Management practices across firms and countries (p. 23). *Academy of Management Perspectives* February: 12-33. Sample of 7,262 manufacturing and 661 retail firms, of which 5,441 are purely domestic and 2,482 are foreign multinationals. Domestic multinationals (such as the domestic subsidiaries of Toyota in Japan) are excluded. See footnote to Figure 4 for details of the survey.

- Prediction 5:** Given the UK's lackluster current export performance in key emerging economies (accomplished mostly by UK-owned firms in the pertinent countries), we predict that attracting inward FDI from these countries would result in multinationals from emerging economies becoming both more interested in and more capable of leveraging Made-in-UK exports to crack their home country markets. For example, only \$1.4 billion (0.4%) of China's outward FDI stock (\$317 billion) is in the UK (Davies, 2012) and China's total outward FDI stock is only about 1.7% of the worldwide total (Peng, 2012; UNCTAD, 2012). Clearly there is more room to grow for the UK to attract more inward FDI from China. We predict that ultimately such inward FDI will facilitate more UK manufacturing exports to China.

For the same reason, we predict that inward FDI from Brazil, India, Russia, and other emerging economies will facilitate more UK manufacturing exports to these fast growing markets.

- Prediction 6:** Inward FDI from emerging economies to Europe will often take a platform approach—that is, a manufacturing operation in one location would aim to serve many (if not all) EU countries. For example, in the 1980s and the 1990s, the UK was particularly successful in attracting Japanese MNEs pursuing such a “European platform” strategy in the automotive industry. Recent trends of MNEs from emerging economies suggest that Indian firms in particular appear to use the UK as a gateway to Europe, while Chinese firms appear more likely to choose Germany as their base.<sup>13</sup> In the long run, freedom of trade in goods within the EU, along with production cost-related factors, will be key to attracting this type of European platform

<sup>13</sup> Authors' analysis of data extracted from the Amadeus/Bureau van Dyck database.

investors—and ultimately leading to their manufacturing exports from the UK to other EU countries.

The third institution-based aspect is the connection between *outward* FDI from the UK and UK exports. Evidence has pointed out that when firms from a country invest abroad, instead of simply shipping low-level jobs overseas, they often generate high-level, high-paying jobs at home (Peng and Meyer, 2011; Peng, 2014). One study found that 100,000 new jobs were created in the UK between 1995 and 2005 due to outward FDI (Driffield et al., 2012: 4). It is true that when outward FDI takes place in low-cost countries, demand for unskilled labor at home is reduced. However, outward FDI often increases exports of products, components, and services (especially high-end ones). For example, a Marks and Spencer store abroad would often increase Made-in-UK food and beverage exports ranging from whiskeys to shortcakes.

Although the UK possesses the world's second highest stock of outward FDI (Table 7) and the Government has long actively supported exports and inward FDI, the Government does not have any explicitly stated policy stance on outward FDI—neither encouraging nor discouraging it. From an institution-based view, we believe that it is advisable for the Government to actively support outward FDI in order for UK firms to reap the benefits of overseas markets (Driffield et al., 2012).

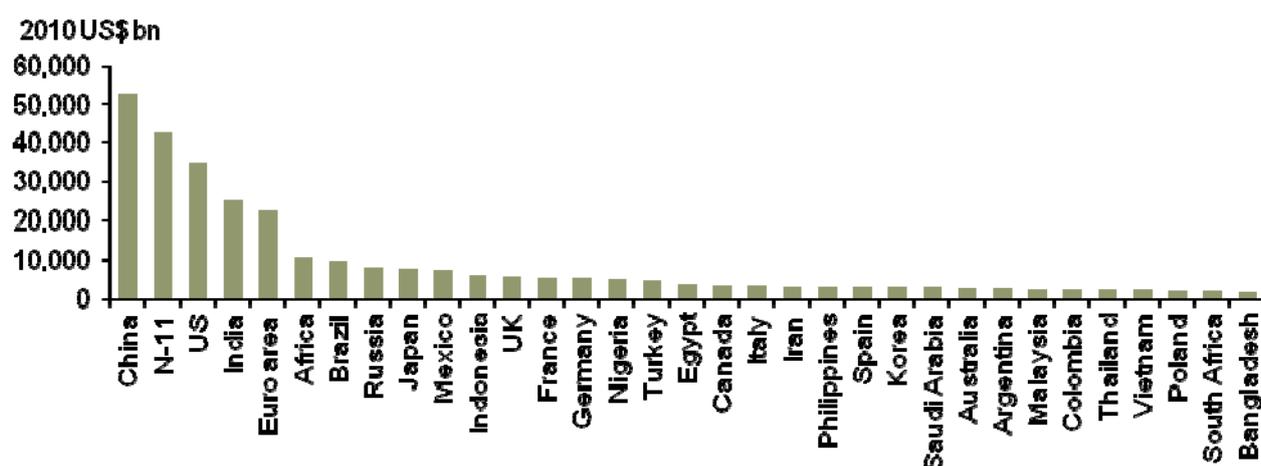
- **Prediction 7:** The Government's active support for outward FDI for downstream stages of value chains would result in more UK manufacturing exports (especially high-end products, components, and supplies) as well as services.
- **Prediction 8:** The Government's active support for outward FDI in services would also result in more UK manufacturing exports in addition to service exports. For example, in India, the retail sector is still largely closed. The Government can encourage India to open the retail sector, which is the world's biggest retail market largely untapped by inward FDI (or outward FDI from the standpoint of UK firms) (Peng, 2014: 33).

## 5. A long term view: out to 2050

### 5.1. Two scenarios of the world in 2050

The first scenario is the rosy scenario that has been widely known. Spearheaded by Goldman Sachs (2012), this scenario suggests that—in descending order—China, the US, India, Brazil, and Russia will become the largest economies by 2050 (Figure 11). BRIC countries together may overtake the US by 2015 and the G7 by 2032, and China may individually dethrone the US by 2026 (Goldman Sachs, 2012: 2). In PPP terms, the BRIC's share of global GDP, which rose from 18% in 2001 to 25% currently, may reach 40% by 2050 (Goldman Sachs, 2012: 3). Overall, BRIC may contribute nearly half of the growth of global GDP over the next two decades. In addition, by 2050, the N-11 as a group may become significantly larger than the US and almost twice the size of the Euro area.

**Figure 11: BRIC and the US will become the largest economies by 2050**

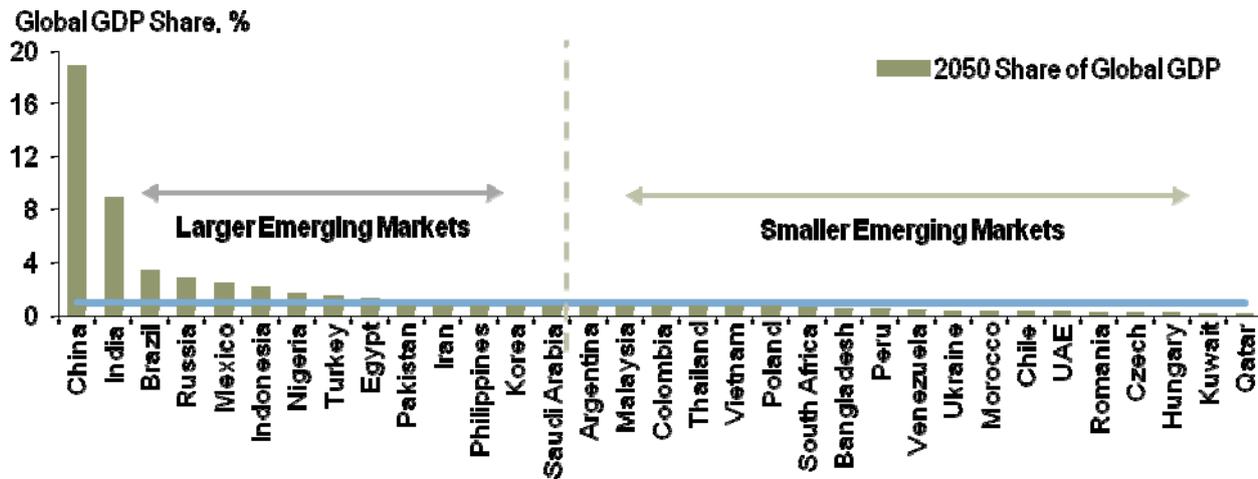


[Source] Goldman Sachs (2012). An update on the long-term outlook for the BRICs and beyond (p. 3). *Monthly Insights from the Office of the Chairman, Goldman Sachs Asset Management*, January. N-11 refers to the Next Eleven identified by Goldman Sachs: Bangladesh, Egypt, Indonesia, Iran, Korea, Mexico, Nigeria, Pakistan, Philippines, Turkey, and Vietnam.

Broadening our thinking beyond a focus on acronyms such as BRIC and N-11, one interesting way is to identify the *larger* emerging markets (defined as exceeding 1% of global GDP by 2050). Nine of the N-11 may exceed the 1% of global GDP threshold by 2050 (Goldman Sachs, 2012). In addition, a number of other relatively *smaller* emerging markets (defined as not exceeding 1% of global GDP by 2050) will exhibit strong growth dynamism and potential (Figure 12).<sup>14</sup> The upshot? While BRIC growth rates will slow down, emerging economies *as a group*—consisting of BRIC, N-11, and other “larger” and “smaller” emerging markets—will continue to drive global growth.

<sup>14</sup> The original labels used by Goldman Sachs (2012) for these two types of emerging markets are “growth markets” (more than 1% of global GDP by 2050) and “emerging markets” (less than 1% of global GDP by 2050). Since the so-called “growth markets” have been widely labeled as “emerging markets,” we have decided to reduce potential confusion by simply re-labeling the first group as “larger emerging markets” and the second group as “smaller emerging markets,” with the cut-off being 1% of global GDP.

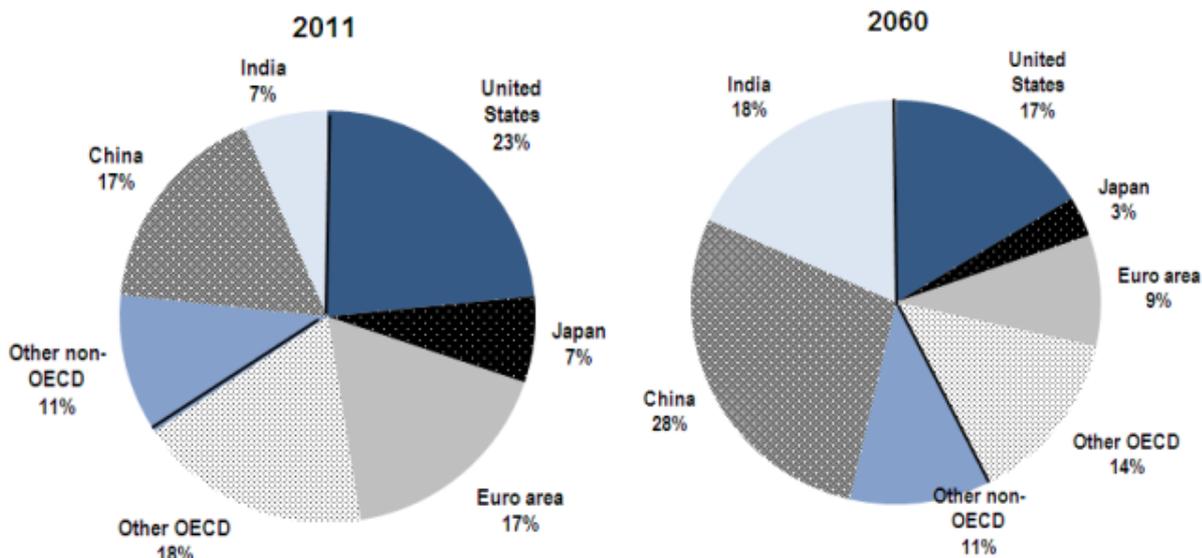
**Figure 12: Larger (> 1% global GDP) and smaller (< 1% global GDP) emerging markets by 2050**



[Source] Adapted from Goldman Sachs (2012). An update on the long-term outlook for the BRICs and beyond (p. 3). *Monthly Insights from the Office of the Chairman, Goldman Sachs Asset Management*, January. In the original publication, “larger emerging markets” are labeled “growth markets,” and “smaller emerging markets” are labeled “emerging markets.” To avoid confusion, we have labeled all of them “emerging markets,” which are differentiated by size. The blue line is the cut-off point of 1% global GDP.

Goldman Sachs’ predictions have been largely supported by other forecasting studies such as HSBC (2011) and OECD (2012). For example, OECD (2012) predicted that by 2060, China, India, and the US will become the top three economies. The combined GDP of China and India will be larger than that of the entire OECD area (Figure 13). In 2011, China and India accounted for less than one-half of GDP of the seven major (G-7) OECD economies. By 2060, the combined GDP of China and India may be 1.5 times larger than the G-7. India’s GDP will be a bit larger than the US’s, and China’s a lot.

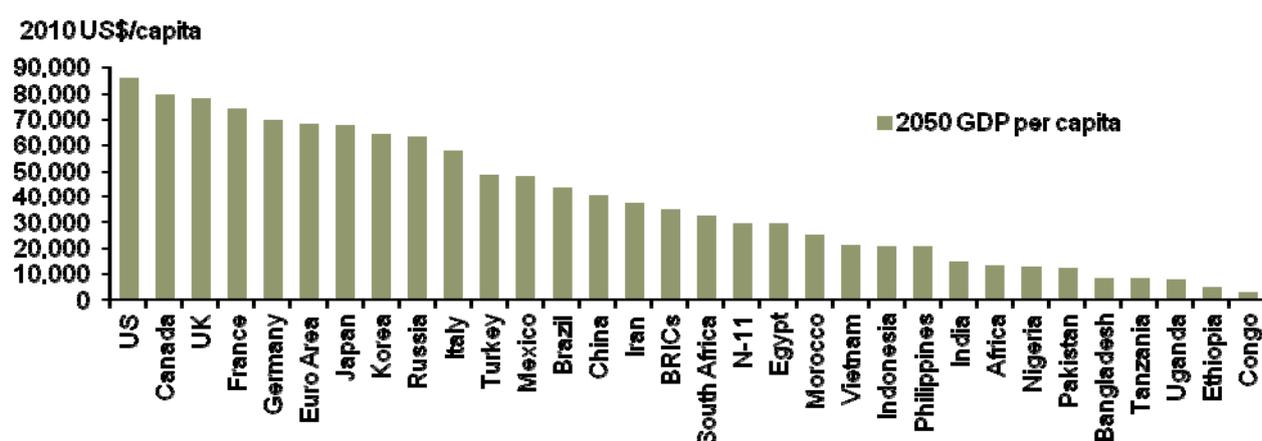
**Figure 13: The percentages of global GDP, 2011 and 2060**



[Source] OECD (2012). Looking to 2060: A global vision of long-term growth (p. 8). *Economics Department Policy Note 5*, November. Note: The comparisons are based on 2005 purchasing power parity (PPP).

Despite such dramatic changes, one interesting constant is the relative rankings of income per capita. Goldman Sachs (2012) predicted that by 2050, the G7 countries will still be the richest. At \$78,091,<sup>15</sup> the UK will enjoy the third highest per capita income among major economies—behind the US and Canada but ahead of France, Germany, and Japan (Figure 14). Ranked eighth globally (\$63,486), Russia may top the BRIC group, with income per capita approaching that of Korea. By 2050, per capita income in China (\$40,614) and India (\$14,766) will continue to lag behind developed economies—at, respectively, 47% and 17% of the US level (\$85,791). These predictions were supported by OECD (2012), which noted that by 2060, Chinese and Indian per capita income would only reach 59% and 27% of the US level, respectively.

**Figure 14: The rankings of per capita income remain relatively unchanged by 2050**



**[Source]** Goldman Sachs (2012). An update on the long-term outlook for the BRICs and beyond (p. 4). *Monthly Insights from the Office of the Chairman, Goldman Sachs Asset Management*, January. N-11 refers to the Next Eleven identified by Goldman Sachs: Bangladesh, Egypt, Indonesia, Iran, Korea, Mexico, Nigeria, Pakistan, Philippines, Turkey, and Vietnam.

Underpinning this scenario are a number of assumptions, such as (1) emerging economies as a group will maintain strong (albeit gradually reduced) growth; (2) geopolitical events and natural disasters (such as climate changes) will not create significant disruption; and (3) regional, international, and supranational institutions continue to function reasonably. This scenario envisions a path of growth that is perhaps more volatile than that of the past 20 years, but ultimately leads to considerably higher levels of economic integration and much higher levels of incomes in countries nowadays known as emerging economies. We may label this scenario “continued globalization” for lack of a better word

The second scenario can be labeled “de-globalization.” This is one of the distinct scenarios identified by Foresight Horizon Scanning Centre (2009). “De-globalization” is characterized by (1) prolonged recession, high unemployment, droughts, climate shocks, disrupted food supply, and conflicts over energy (such as “water wars”) on the one hand; and (2) public unrest, protectionist policies, and the unraveling of certain institutions that we take for granted (such as the EU) on the other hand.

The upshot? Weak economic growth around the world. While global de-integration would harm economies worldwide, regional de-integration would harm countries of Europe, especially those outside a likely residual core of the EU. Unable to keep growing

<sup>15</sup> All dollar amounts quoted in this paragraph refer to 2011 USD.

sustainably, BRICs may become “broken BRICs” and may fail to reach their much-hyped potential (Sharma, 2012). For example, in the 1950s and 1960s, Russian economic growth was also very impressive, fueling the Soviet geopolitical ambitions that turned out to be unsupportable eventually. In the late 1960s, Burma (now Myanmar), the Philippines, and Sri Lanka were widely anticipated to become the next Asian tigers, only to falter badly (Sharma, 2012). Over the long course of history (dating back to 1 AD) studied by Maddison (2007) and the recent postwar decades, it is very rare to sustain strong growth in a large number of countries over more than a decade. It is true that the first decade of the 21<sup>st</sup> century—prior to the Great Depression—witnessed some spectacular growth in BRIC and many other emerging economies. A key question is how unique current times are (van Ark, 2010). Historically, “failure to sustain growth has been the general rule” (Sharma, 2012: 3).

In both scenarios, one common prediction is that competition for manufacturing exports will heat up. Competition under the “de-globalization” scenario would be especially intense since the total size of the “pie” may not be growing sufficiently (if not negatively). At the same time, firms would operate in partially protected markets, which result in additional costs for market penetration.

Competition under the “continued globalization” scenario would also be intense, but in different ways. On the one hand, since a rising “tide” may be able to lift “all boats,” the “UK boat”—also known as UK plc—can be lifted. However, UK firms would face potential competitors quite literally from any location in the world, and hence would only benefit when UK firms are strong on that global stage.

Both scenarios have in common that emerging economies will grow faster than today’s mature economies. This has some specific implications for the UK. In 2010, the UK share of the world’s goods (mostly manufacturing) exports was 2.6%, while in the economies predicted to be the top 30 by 2050 (Figure 11) for which we have data about their imports (Figure 8), the UK share of their imports tends to be below 2.6% in 2010. Among emerging economies, only in the 30<sup>th</sup>-ranked South Africa (by 2050) does the market share of UK imports (6.8% of total imports) exceed its top three developed markets (France: 5.9% of total imports; US: 4.6%; Germany: 4.5%). In BRIC, only in India did UK imports exceed 2.6% (Figure 8). Clearly, UK firms need to do better to win these emerging markets.

## 5.2. Technologies for Future Manufacturing

In the search of export potential for the future, a focal question is in which industries UK firms may be able to generate resources—and hence products—that meet the criteria of being valuable, rare, and hard to imitate. On the one hand, these can arise from the strengthening of industries where the UK already has a comparative advantage, or where such a comparative advantage is already emerging. On the other hand, new technologies are continuously emerging. Hence, building comparative advantages for 2050 will require simultaneous exploitation and development of existing industries, while exploring and creating conditions conducive for the development of entirely new industries.

- **Prediction 9:** In manufacturing industries using more traditional technologies, the UK will continue to be competitive in industries in which the UK has revealed comparative advantage (in alphabetical order):
  - Aerospace, both civil and military.
  - Automobiles (including automotive components).

- Chemicals.
  - Pharmaceuticals and medical biotechnology.
- **Prediction 10:** In manufacturing industries using more traditional technologies (except those in which the UK has revealed competitive advantage), UK firms that have decisively discovered, leveraged, and shifted toward *deeper niches* will enjoy significant export success by 2050. For example, although the UK apparel/textile industry is no longer internationally competitive, UK firms are highly competitive in *thread*. Instead of “making” (or technically “assembling”) Airbus, the UK has become a leading specialist in making Airbus *wings*. In Europe, there are a number of inspiring examples from certain firms in smaller countries, such as Denmark in specialty toys, Sweden in car carriers (the trucks that carry cars from factories to ports or dealer shops), and Switzerland in watches and surveying equipment. Lastly, the 2011 earthquake in Japan has revealed several important lessons on how firms in a high-cost country can maintain manufacturing competitiveness by engaging in a deeper niche strategy (Box 4).

#### Case Study Box 4: Lessons from Japan’s Earthquake

On March 11, 2011, Japan suffered from a triple disaster—a 9.0 earthquake (its worst in recorded history) followed by a 20-foot tsunami followed by a nuclear power plant accident that emitted harmful radiation. From a global standpoint, a lot of non-Japanese firms that relied on Made-in-Japan products were ill-prepared for such a sudden and major breakdown of their supply chain. Despite the widely noted migration of manufacturing jobs to low-cost countries such as China and Malaysia, Japan has remained an export powerhouse. In 2011, it was the world’s 4th largest exporter (after China, Germany, and the United States) with \$823 billion goods exports. For example, Japan produces approximately one-fifth of the world’s semiconductors and 40% of electronic components. While low-end products tend to be made overseas, “Japan has higher and higher market share of specialty materials as you go up the value chain,” noted one expert. For example, Boeing outsourced 35% of the work on its newest 787 Dreamliner to Japanese manufacturers. Among them, Mitsubishi Heavy Industries built the 787’s wings using the world’s most advanced composite material and no one else could do the job—Boeing had no plan B. On March 17, 2011, General Motors closed two US-based factories for a week due to a lack of components arriving from Japan. For planes, cars, and laptops assembled outside of Japan, the Made-in-Japan components may represent a relatively small amount, but they tend to be higher-value and mission-critical. “If the Japanese cannot supply,” noted another expert, “then no one is going to get their iPad 2” because no smart factory can build an iPad 2 with only 97% of parts.

The lessons for the future of UK manufacturing are clear: (1) High-end manufacturing, even in a high-cost country, can be competitive if these products deliver the kind of value that is so rare and irreplaceable (think of Mitsubishi Heavy Industries’ capabilities to make the Dreamliner’s composite wings). (2) In global competition, deeper niches in high-tech, mission-critical areas are more defensible in developed economies, while manufacturing of commoditized, broad-based, low-end products is more appropriate for lower cost locations.

[**Sources**] Based on (1) *Bloomberg BusinessWeek*, 2011, Downsides of just-in-time inventory, March 28: 17-18; (2) *Bloomberg BusinessWeek*, 2011, Facing up to nuclear risk, March 21: 13-14; (3) *Bloomberg BusinessWeek*, 2011, Now, a weak link in the global supply chain, March 21: 18-19; (4) M. W. Peng, 2014, *Global Business*, 3<sup>rd</sup> ed. (476), South-Western Cengage Learning: Cincinnati, OH.

Some examples of *deeper niches* that UK firms may enjoy significant export success by 2050 are listed below (in alphabetical order). Our selection is guided by the search for strategic sweet spot illustrated by Figure 9, and not necessarily by the quest for fancy, high technology. Specifically, what will export customers demand? What are the areas in which UK firms' resources and capabilities are better than rivals'? Within each of these industries or segments, emphasis should be on the *high end* as opposed to the lower end.

- Equestrian goods. (Although being “non-manufactured” exports, UK-bred horses will be competitive in emerging economies as the new high-income segments develop their taste for equestrian sports.)
  - Luxury branded food.
  - Luxury branded goods.
  - Leisure marine transport (yachts and small boats).
  - Outdoor clothing and equipment.
  - Parachute (specialized textiles).
  - Pet care.
- **Prediction 11:** New technologies are revolutionizing manufacturing industries. We thus venture to predict that UK firms have the potential to emerge in new industries that integrate in novel ways previously unrelated industries, or serve entirely new needs. Such new manufacturing sectors may include, for example, the following:
    - Smart grid. This is a prerequisite for an electricity system that meets the UK's carbon reduction requirements by 2050. Smart grid has three components: (1) power transmission and distribution, (2) grid-level power storage (“mega batteries”), and (3) smart metering and sensor networks. Technologies in these areas may not yet be mature and international standards have not been agreed on (Foresight Horizon Scanning Centre, 2010: 11). However, they are of pivotal importance for economies to make best use of new sources of energy such as wind and solar, whose generation cannot be time synchronized to energy usage. Firms in the first country that overcome these challenges will enjoy first-mover advantages in export markets.
    - Tidal and wave energy system. Leveraging Britain's island geography (an attribute hard or impossible to imitate by many UK rivals), SeaGen installed the world's first tidal energy system in Strangford Lough, Northern Ireland, in 2008 (BIS, 2012b: 94). The UK also developed the world's first commercial wave farm that began to operate in Portugal in 2008. After hydro, solar, and wind power, tidal and wave energy may be the last (currently known) frontier for renewable energy. While hydro, solar, and wind power segments have become rapidly maturing, unfortunately UK firms have not become world-class in these segments. Therefore, developing tidal and wave energy system is an opportunity if the UK aspires to lead a renewable energy industry.
    - New batteries. More efficient use of energy (for example in mobile devices or in e-cars) requires the ability to store energy using smaller and lighter batteries. Researchers in many parts of the world (such as those at Oxford-based start-up company Nexeon [[www.nexeon.co.uk](http://www.nexeon.co.uk)]) are thus working on new ideas, such as lithium-ion batteries.
    - Intelligent medical devices. In aging societies, new devices that facilitate the life of the elderly or support the interaction between patients and medical professionals are a major growth area. Such devices integrate information

technologies with existing or new appliances. For example, in the Silicon Southwest network of entrepreneurs, several start-ups are experimenting with such ideas ([www.siliconsouthwest.co.uk](http://www.siliconsouthwest.co.uk)).

- **Prediction 12:** In manufacturing industries using newer technologies, we predict that the technology that is potentially most promising, most revolutionary, and most beneficial to the UK is additive manufacturing (or 3-D printing). We concur with Technology Strategy Board (2012: 20), which identified additive manufacturing as its first most promising technology for the UK. Labeled by the *Economist* (2012a) as a “third Industrial Revolution,” additive manufacturing enables products to be manufactured economically in much smaller numbers, more flexibly, with a much lower input of labor and a much lower amount of wastage. While this technology has been used in rapid prototyping and in small-scale production of individually differentiated products such as dental jawbones, jewelry, shoes, car dashboards, and engine parts, its industrial-scale application is still being developed (Gershenfeld, 2012: 57). Reducing the economies of scale associated with large-batch/large-factory-type production, this new technology may bring some jobs lost to low cost countries back to developed economies such as the UK (*Economist*, 2012a). Further, leveraging UK skills in design and services, this technology will facilitate additional exports from the UK.

Overall, from a resource-based view, the challenge is finding internationally competitive and sustainable deep niches that can leverage UK excellence in a valuable, rare, and hard-to-imitate way. If the current capabilities in certain areas are not competitive, the challenge will be how to develop and propel them to a world-class level. From an institution-based view, whether UK manufacturing will remain competitive in 2050 will also depend on how the rules of the game change—as outlined next.

## 6. Competing for the Future: Recommendations for Firm Managers and Government Policymakers

Because manufacturing drives exports, innovation, and productivity, it matters a great deal by ultimately impacting standards of living and economic performance. In this section, we offer a series of recommendations to firm managers and government policymakers, which are organized according to the resource-based and institution-based views (Table 8). Because we have mentioned some of the advice to managers in earlier sections, our emphasis in this section is on policy recommendations.

**Table 8: Recommendations**

	<i>Recommendations for Firm Managers</i>	<i>Recommendations for Government Policymakers</i>
Resource-based view	<ol style="list-style-type: none"> <li>1. Build organizational strengths based on the resource-based framework by focusing on the value, rarity, and inimitability (VRI) of resources and capabilities</li> <li>2. Find and leverage unique, knowledge-based, deep niches</li> <li>3. Look for value-adding ways to combine manufacturing with services</li> </ol>	<ol style="list-style-type: none"> <li>4. Support pre-competitive manufacturing capabilities and future technology platforms</li> <li>5. Push firms to reach for the high end and do not support competition on low cost for the sake of jobs</li> <li>6. Strengthen human capital to enable advanced manufacturing</li> </ol>
Institution-based view		<ol style="list-style-type: none"> <li>7. Remove uncertainty by clarifying the UK's commitment to stay in the EU</li> <li>8. Enhance certainty by negotiating more free trade agreements (FTAs)</li> <li>9. Create a tax regime that is competitive, stable, and fair</li> <li>10. Attract more inward FDI and promote more outward FDI</li> <li>11. Facilitate the mobility of highly qualified individuals into and out of the UK</li> <li>12. Lead efforts to lift regulatory trade barriers such as the EU arms embargo on China</li> </ol>

### 6.1. Three recommendations for firm managers

#### Recommendation I

***Build organizational strengths based on the resource-based framework by focusing on the value, rarity, and inimitability (VRI) of resources and capabilities***

There is nothing novel on the proposition that firms “compete on resources and capabilities.” The subtlety comes when managers attempt to distinguish firm-specific

resources and capabilities that are valuable, rare, and hard to imitate, and build organizational strengths (such as dynamic capabilities) to continuously generate new resources and capabilities (Peng, 2014 82). Resources and capabilities not meeting the VRI criteria will need to be discontinued and/or outsourced unless they have critical linkages to firms' core value adding activity. Think of the Burberry dog cover-ups and leashes, which contributed to sales but not corporate strengths (Box 3). A rigorous resource-based analysis helped managers (re)discover that it is *Britishness*—more specifically Burberry trench coats designed and made in the UK—that would meet the VRI criteria, thus deserving to be the center of gravity around which organizational strengths should be built.

## Recommendation 2

### ***Find and leverage unique, knowledge-based, deep niches***

To be competitive over the broad range of segments within any given industry is increasingly challenging. A focus on unique, deep niches by leveraging specialized knowledge is the way to go. German *Mittelstand* firms such as Kronos (beverage bottling and packaging systems), Heidenhain (encoders for manufacturing equipment), and Dorma (moveable walls) may not be household names, but they hold up to 90% worldwide market share in their deep niches. *Mittelstand* firms as a group collectively contribute 40% of German exports. For UK firms, such niches exist in manufacturing industries using traditional technologies such as equestrian goods and textile threads, and may exist in emerging industries such as additive manufacturing, smart grid, and tidal and wave energy system. Ideally, such niches will focus on the high end, leveraging UK strengths in design, creativity, and R&D.

## Recommendation 3

### ***Look for value-adding ways to combine manufacturing with services***

Manufacturing per se is often relatively easy to imitate. Smart combination of manufacturing and services will make it harder for rivals to imitate. A well-known success story is Rolls-Royce's transformation from an engine producer to a service provider for airlines. Similar examples galore where complex appliances (such as lifts, commercial vehicles, and power stations) are manufactured for use over long periods, especially by corporate customers. In the future, it is possible to envision UK leisure marine firms such as Fairline Boats (a world leader in the 38-80 ft powerboat segment) to both export Made-in-UK boats and provide 3-D printers that can "print" out spare parts on-site for export clients around the world—an interesting example of smart combination of manufacturing and services.

## 6.2. Nine recommendations for government policymakers

### Recommendation 4

#### ***Support pre-competitive manufacturing capabilities and future technology platforms***

The UK Government, like all EU governments, is restricted in the ability to provide direct subsidies to firms. In global competition, this may place UK (and EU) firms at a

disadvantage relative to their rivals in the US and Asia, which can benefit from more direct government support. However, there are ways for the UK Government to be more active. For example, Technology Strategy Board (2012) announced its funding of at least £50 million a year to support pre-competitive manufacturing capabilities and future technology platforms. Such much-needed investments will speed up the process for successful commercialization and help firms jump through the hurdles associated with the “valley of death” (good ideas flame out before emerging technologies become competitively and commercially successful).

## Recommendation 5

### ***Push firms to reach for the high end and do not support competition on low cost for the sake of jobs***

Bucking the trend that low-cost manufacturing jobs are migrating to low-cost countries is neither advisable nor realistic. The UK Government should encourage firms to reach for the high end, which thrives on high productivity. Focusing on low cost may generate short-run benefits, but will in the long run result in severe stagnation of manufacturing productivity. Thus, the UK should steer away from attempts to compete on lower cost—for example, through policy measures that lower labour cost and lengthen permissible work time. Such policies may encourage manufacturing in sectors where the UK would be competing with countries that have much lower per capita income (such as Eastern Europe or East Asia). In the medium term, the UK would be squeezed out of this market segment. In other words, attempts to build such low-cost sectors (such as final assembly of low-end electronics or cars) may generate job growth in the short run, but are not sustainable in the long run—unless the UK is willing to accept a fall in average incomes to the level of, say, Poland or Romania.

## Recommendation 6

### ***Strengthen human capital to enable advanced manufacturing***

While hardly an original recommendation, this point must be emphasized: UK manufacturing will not (re)gain world-class competitiveness in the absence of high-level human capital. UK firms’ endeavors to build high-end, high-productivity-based capabilities are essentially efforts to engage in human capital-intensive manufacturing. Effective Government support can help to build human resources that enable such advanced manufacturing. This leads to two ideas. First, the UK has leading-edge universities and technology clusters, yet the gap between the top end and the “average” human capital is rather large. Therefore, the UK ought to foster its elite institutions while at the same time enhancing the diffusion of knowledge and skills from the elite institutions to the second and third tier.

Second, the UK needs to build capabilities in the *workforce* that enable world-class manufacturing.<sup>16</sup> This would entail investing heavily in human capital development. Such investment should in part come from the Government. This is because the positive spillovers of skills and capabilities (especially from low to medium levels) from productive individuals to society at large are substantive. Essentially we advocate the raising of skills

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<sup>16</sup> The Foresight Project Team has commissioned another Review on workforce development and labor markets.

beyond the elite institutions, because sustaining a high income for an entire nation requires high performance capabilities possessed by a broad segment of the population, and not only by the elites. Three specific priorities can be:

- Providing more resources for primary education in the state system to enable children to enter a path of personal development and human capital formation that is independent of their parents' ability and willingness to invest in their education. This issue is often discussed as a social concern in the UK, yet it has—at least in the long run—major economic and competitiveness implications. Thus, it is relevant to the long run competitiveness of UK manufacturing exports.
- Prioritizing vocational training, which has been severely weakened by past policies such as abolishing traditional apprenticeships and converting polytechs into (too often second or third rate) universities. One stream of actions may extend initiatives to re-introduce vocational training through apprenticeships, which requires multi-year courses in collaboration between industry and educational institutions on a more comprehensive basis and with more resources—far more than what current pilot projects envisage. Germany and other Northern European countries show examples on how this can be done—with a positive impact on export competitiveness. Another stream of action may focus on colleges and universities that provide vocational training, notably providing funding regimes that encourage such training and eliminate the evaluation of third rate universities by the criteria more appropriate for Oxford and Cambridge (which de facto encourages third or fourth rate research of very limited value).
- While the first two actions require much wider efforts and political will, we believe that there is a third action that is smaller in scope and more practically actionable. Given that skilled manufacturing workers are now a scarce resource in the UK but downturns and recessions are inevitable, the UK can take a page from the playbook of Germany's labor market arrangements to reduce employment volatility. Since the 1970s, German firms can apply for subsidies to keep workers on the payroll during downturns. More recently, a “mini-job” program targets younger workers and unemployed but experienced older workers, providing jobs for 15 hours per week at a set pay rate. Such government efforts to reduce labour market volatility, especially during downturns and recessions, enhance employers' willingness to hire and train workers and employees' motivation to invest in and enhance their own human capital. Such government support can also foster the wider spread practice of high commitment work systems. Centered on employee engagement, high commitment work systems can contribute toward innovation and enhance organizational performance.

While our first three recommendations (#4 – #6) for policymakers are *resource-based* in nature, aiming at helping UK firms enhance their capabilities, our next six recommendations (#7 – #12) for policymakers—the bulk of our advice—are derived primarily from the *institution-based* view.

## Recommendation 7

### ***Remove uncertainty by clarifying the UK's commitment to stay within the EU***

As rules of the game, institutions serve to reduce uncertainty. Managers hate uncertainty, especially when it comes to long-term commitments such as constructing a new manufacturing plant. Despite the EU's problems, the UK's periodic threats to leave the EU—such as Prime Minister David Cameron's speech in January 2013 (while we were in

the middle of doing this research)—heighten uncertainty and undermine UK trade and investment. In view of the large and growing importance of regional integration in supply chains and of the fact that the EU accounts for more than 50% of UK exports, an exit of the UK from full EU integration would be *disastrous* for much of UK manufacturing. Given that emerging economies only collectively purchase less than 8% of UK exports, the loss of exports to the EU will not be compensated by the additional exports to emerging economies.

Uncertainty over the status of the UK's membership in the EU—and hence the specific rules applying to trade between the UK and other EU countries—is in particular likely to depress inward FDI, especially manufacturing investment by non-EU firms in regional platform investment. Historically, the UK has been quite successful in attracting investors looking for a base to serve EU markets—Toyota, Nissan, and Honda come to mind. But such investment in particular will be on hold or go elsewhere if the uncertainty about the future status is not removed (*Economist*, 2013b). Moreover, participation in regional value chains (and hence intra-regional trades in components) facilitates exports of downstream products eventually destined for countries outside the EU. Given the relatively slow growth in the EU, future marginal increases of benefits for the UK to stay within the EU may be less than what they have been in the past. However, we see no reason to put at risk the existing benefits, which are still very substantial (i.e. over half of UK exports).

## Recommendation 8

### ***Enhance certainty by negotiating more free trade agreements (FTAs).***

Firms from FTA member countries typically increase their trade and investment activities due to the tremendous certainty brought by FTAs. The EU currently has FTAs with 28 countries: Albania, Algeria, Andorra, Bosnia and Herzegovina, Chile, Colombia, Croatia, Egypt, Faroe Islands, Iceland, Israel, Jordan, Lebanon, Liechtenstein, Macedonia, Mexico, Montenegro, Morocco, Norway, Palestinian Authority, Peru, San Marino, Serbia, South Africa, South Korea, Switzerland, Tunisia, and Turkey. The EU recently concluded negotiations with Singapore, and is also currently negotiating with three individual countries (India, Japan, and Russia) and three regional entities (Association of South Eastern Asian Nations [ASEAN], Gulf Cooperation Council [GCC], and Mercosur).

Firms clearly prefer multilateral agreements to bilateral FTAs. Bilateral FTAs tend to create different rules applying to different pairs of export/import countries, which greatly increase the bureaucracy that exporters and importers have to deal with and reduce the scope for scale economies. Therefore, we prefer a multilateral FTA between the EU and ASEAN to a bilateral FTA, for example, between the UK and Singapore.

In order to increase more UK manufacturing exports, we recommend that the UK advocate more EU efforts to negotiate the following FTAs:

- Complete the negotiations for the Transatlantic FTA with the United States and Canada. Progress for the Transatlantic FTA has been slow, but may be accelerated following recent initiatives on both sides of the Atlantic.
- Another obvious candidate with which the UK should be interested in having an FTA is the Australia-New Zealand Closer Economic Relations Trade Agreement (ANZCERTA or CER).

- In the long run, the UK (via the EU) should entertain FTA negotiations with China. China already has FTAs with ASEAN, Chile, Costa Rica, New Zealand, Pakistan, Singapore, and Peru, and is negotiating with Australia, Iceland, Japan, Norway, and South Korea as well as two regional bodies: GCC and Southern African Customs Union (SACU). Given the UK's low import market share in China, an FTA will definitely help promote more UK exports there.

## Recommendation 9

### ***Create a tax regime that is competitive, stable, and fair***

Global competition is also about tax competition. While the UK corporate tax rate of 28% appears to be relatively pro-business, the tax regime has recently given a decidedly *mixed* message to UK firms. Legislation designed to encourage R&D spending in the UK was followed by cutbacks in tax deductions for capital expenditure (PwC, 2009: 33). Some of the UK's competitors have aggressively used favorable tax as a means to lure investment and jobs. For example, Ireland only levies 10% corporate income tax on manufacturing income between the 1980s and 2002 and 12.5% since 2002, thus attracting many investors to locate in Ireland. In addition, new EU members Hungary and Bulgaria have aggressively reduced their corporate income rates to 16% and 10%, respectively.

A tax system will however only be stable if it is generally accepted by the population (i.e. the electorate in a democracy) to be fair. Some corporate taxation systems de facto do not tax firms at the location where the profit is generated, but (by default or through consciously created loopholes) allow firms to shift profits from high tax locations to low tax locations through practices such as transfer pricing and excessively high licensing fees. This is likely to undermine the legitimacy of an international system of tax competition. In other words, if nations compete on taxes, they also need commonly agreed rules (i.e. institutions) by which this competition takes place. Perhaps surprising for most UK observers, the UK may actually benefit from more integration in the EU on this matter because it would prevent incidences such as Google and Starbucks paying virtually no tax in the UK.

Given that the future of UK manufacturing will be mostly high end, high tech, and high R&D, commoditized manufacturing may very well move to low tax jurisdictions. Thus, it is imperative that the UK Government create and maintain a tax regime that is competitive, stable, and fair. Otherwise, just like other forms of uncertainties, uncertainties associated with the tax regime will hurt the UK's attractiveness as a manufacturing and R&D location, and undermine future investment and exports. Reducing corporate tax rate from 28% to 23% in 2014/15 will be helpful. But clearly more can be done.

## Recommendation 10

### ***Attract more inward FDI and promote more outward FDI***

Given that foreign multinationals generate approximately half of UK manufacturing exports, it seems imperative that the UK continue to attract inward FDI in order to increase exports. The most important policies to this end are the same that also promote domestic investment in manufacturing: free trade within the region and valuable, rare, and hard-to-imitate resources that foreign investors can tap into.

Exports are generated by a combination of “push” and “pull” effects. While UK-based firms (including UK-based foreign multinationals) “push” exports, UK multinationals—via outward FDI abroad—“pull” UK exports into their host economies, often in the form of high end products, components, and service exports. Given that the UK has the second largest stock of outward FDI, it seems natural that efforts be strengthened to promote more outward FDI, especially into downstream and service activities.<sup>17</sup> Incorporating the protection of FDI into FTAs (fostering a formal institution) and promoting the views of businesses “out in the world” as ambassadors and supporters of the British economy (creating an informal institution) are likely to help.

## Recommendation 11

### ***Facilitate the mobility of highly qualified individuals into and out of the UK***

Mobility of people is an essential precondition for successful international trade, especially in the high end of both manufacturing and services. The UK benefits from being a more multicultural society than most of its EU peers. This attraction enables many knowledge-based, creative industry sectors to thrive, and facilitates the coordination of global operations out of the UK. In this regard, the UK Government policy has been confusing to say the least. On the one hand, Deputy Prime Minister Nick Clegg (2013: 107) wrote in the *Economist*: “We will continue to be one of the most open economies on the planet, welcoming trade and investment and welcoming talented individuals who wish to make a contribution to Britain.” On the other hand, shrinking immigration quotas, more visa application procedures, abstention from Schengen area free-travel arrangements, and increased requirements in citizenship tests all send a very strong, disconcerting message that—in a complete reversal of UK policies over the past century or more—the UK no longer welcomes skilled immigrants or temporary workers. In summary, if the UK is serious about promoting export competitiveness, it will have to be serious about making it less cumbersome for highly qualified individuals to move into and out of the UK.

## Recommendation 12

### ***Lead efforts to lift regulatory trade barriers such as the EU arms embargo on China***

Removing regulatory trade barriers can obviously facilitate more UK exports and generate more jobs. Commanding a 6% world share, aerospace and defense represent one of the UK’s most globally competitive manufacturing industries (BIS, 2010a). The UK is desperate to expand manufacturing exports to China, where currently the UK only has 0.9% import market share. China has expressed an interest in importing arms from the UK. But the UK has declined, because of an institution-based trade barrier: the EU arms embargo on China since 1989 due to the Tiananmen Square incident.

During the 1980s, the UK, as well as other EU members and the US, did export to China a limited amount of military aerospace products (mostly avionics and engines). Although China was eager to modernize its military with Western help in order to deter the Soviet

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<sup>17</sup> It is possible that outward FDI may be made at the expense of investment within the UK. If so, careful research on the potentially negative economic implications is needed. Assessment should be made on whether the net impact would be positive or negative (Driffield et al., 2012). However, such assessment is beyond the scope of this Review. The Foresight Project Team has commissioned another Review on the impact of FDI.

threat, China's financial means were extremely limited.<sup>18</sup> Yet, since 1989, the US and the EU have imposed arms embargos on China and cancelled all arms contracts. In the 1990s, as China became wealthier but could not obtain arms from the West, it turned to Russia for advanced weaponry. China has become the number one importer of Russian arms and one of the world's largest arms importers. China now has several hundred high-performance Sukhoi 27 Flanker fighters at the cost of *billions of dollars*, suggesting a potentially missed opportunity of exporting Made-in-UK high performance jets such as the Eurofighter Typhoon.

At first glance, our recommendation may appear outside-the-box (or even radical). It is not. From a resource-based perspective, the defense sector—and the aerospace industry in particular—is an area where the UK has cutting edge capabilities that it can exploit, but needs to continuously renew to remain globally competitive at the high end. From an institution-based view, already in 2004, the EU planned to lift the embargo by 2005. But intense US pressures forced the EU to abandon the plan (Hellstrom, 2010). In 2009, UK Business Secretary Peter Mandelson stated that the ban should be phased out (Reuters, 2009). China is an officially recognized Strategic Partner of the EU. Not surprisingly, China has called the ban “absurd,” “puzzling,” and “political discrimination” against a Strategic Partner. In other words, it is time for the UK to quit “lecturing” countries such as China on how their societies should be run (despite their political imperfections).<sup>19</sup>

Moreover, we have to ask: who has benefitted from the EU arms embargo on China? Obviously, Russian aerospace firms such as Sukhoi. Further, US aerospace firms such as Boeing and Northrop Grumman also benefit, not by exporting to China (they do not), but by curtailing the economies of scale of UK (and EU) firms that would have been gained by exporting to China. In other words, the arms embargo has helped enhance the competitiveness of UK (and EU) firms' global rivals in Russia and in the US. It has also supported Russian and US jobs at the expense of UK jobs.

China is likely to be an eager customer for military and aerospace technologies. A simple Porter five forces analysis suggests that China is not likely to be so happy with the bargaining power of its sole high-tech arms supplier, Russia. Fostering more competition, dual sourcing is always better than single sourcing. However, delaying this liberalization further is likely to undermine this demand. With the rapid development of the aerospace industry in China (which started testing two stealth fighters in the last two years and an advanced military transport jet in January 2013), China may no longer be interested in UK (and EU) aerospace and defense products even when the embargo is lifted.

We understand that this recommendation is likely to be controversial because of its potential geopolitical and military ramifications. However, given *our mandate to search for the future markets for UK manufacturing exports with a view to 2050*, we argue that it is important that the issue be discussed free from prejudices.

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<sup>18</sup> In the 1980s, the Chinese military was seriously interested in the British Harrier jump jet and the French Mirage 2000 fighter, and sent test pilots to check them out. Since China at that time could not afford these expensive modern combat aircraft, it did not place any orders.

<sup>19</sup> We thank Jim O'Neill (Chairman, Goldman Sachs Asset Management, who coined the term “BRIC” more than a decade ago) for this insight. During our interview, he went on to suggest: “Some policymakers elsewhere think that the UK is both hypocritical and a bit lost in the past, when it does not realize that its time to lecture others passed. I think this is quite an important issue that many British policymakers struggle to grasp.”

## 7. Conclusion

In global competition, no advantage is forever. As the first industrial nation, the UK enjoyed significant first-mover advantage. In 1900, with 2.2% of the world's population it generated 15% of exports. But it is not realistic to sustain this level of preeminent performance in the face of increasingly strong global competition. However, it is important to note that the UK is still punching *above* its weight: with 0.9% of the world's population, it currently generates approximately 3.3% of the world's exports—including 6.6% of service exports and 2.6% of goods exports.

What does the future hold for UK manufacturing exports? Lacking crystal balls, we have to gain a deeper understanding of the past if we endeavor to engage in the perilous exercise of predicting the future.<sup>20</sup> The data that we have analyzed for this Review suggest that the UK's relative decline in manufacturing appears to have accelerated in the last decade, not only vis-à-vis emerging economies but also relative to European peers. In the 1980s and 1990s, there was a widespread belief in the UK that service growth would more than compensate for the relative loss of manufacturing capabilities. Today, in part as a consequence of policies launched two or three decades ago, the UK is indeed a global leader in many service sectors with a service trade surplus. The problem, however, is that the corresponding deficit in the trade of goods is so large and growing that it cannot be compensated by the success of service exports. In the future, reviving and strengthening UK manufacturing seem to be a must.

In conclusion, our Review suggests that UK manufacturing firms have good opportunities to compete in both old and new segments within “high end” industries, if they can create and occupy *deep niches* for themselves. To this end, we recommend focusing policy efforts on developing world-class competitiveness of both individuals and firms (and hence of the nation), and to enhance an open and pro-competition trade and investment environment. From the resource-based and institution-based views, the key to winning the future markets for UK manufacturing exports lies in (1) UK firms' possession of valuable, rare, and hard-to-imitate resources and capabilities that can translate into products appreciated by customers, and (2) the Government's resolve and courage to embrace policy challenges that will ultimately make the nation more competitive and prosperous.

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<sup>20</sup> In our quest for parsimony guided by the resource-based and institution-based views, we have left a series of other factors that potentially impact UK manufacturing export performance unexplored. While beyond the scope of our Review given our assigned mandate, these unexplored issues clearly require additional research. For example, currency depreciation is generally supposed to make exports more competitive. However, between 2008 and 2009 sterling lost 25% of its value against major currencies. But UK goods export performance suffered instead of improving (see Figure 2). The devastation of the 2008 financial crisis presumably washed away any advantage brought by depreciation. Also, we have not discussed the incentives to export. This of course raises questions of corporate governance and of organizational design. Is the “short term” character of much UK corporate governance consistent with the long term needs of a high value added manufacturing sector—for example, the needs for significant R&D? Do UK capital markets provide adequate funding for the capital-intensive projects required in this sector? We appreciate one peer reviewer for raising these thought-provoking questions, and we call on future researchers to embark on thorough investigations of these questions.

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