The Future is Another Country
Brexit, CAP and the future of British agriculture

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About the Author

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Richard is the author of “African agriculture: This other Eden”, “A revolution of sorts”, “From field to laptop: the changing face of soft commodities trading”, “Water on oil” and “China’s grain drain”. He also wrote the agriculture chapter of “The Fastest Billion” a book on Africa’s economic prospects. Richard sat on the Royal African Society’s Africa-UK working group on Food Security and has peer group reviewed a number of academic studies. He has written for various publications including the Financial Times, Standpoint Magazine, The Moscow Times, the SCMP, the Kyiv Post, Euromoney and Latin American Investor. He has also contributed widely to television and radio networks including BBC World, CNN, CNBC, Reuters and Bloomberg TV. He holds degrees from the University of Strathclyde in Scotland and L’Ecole Nationale des Ponts et Chaussées in Paris, France’s oldest grande école.

Mapping the post-Brexit landscape

The triggering of Article 50 by the British government on 29 March 2017 offers a one-off opportunity for the UK to eliminate agricultural subsidies after 2020 and refocus efforts on the promotion of value-added agricultural technologies. This transformation will allocate capital efficiently and bring wide-ranging social and economic benefits across the UK economy. It may also redefine the country’s objectives in trade, aid and economic diplomacy.

The past is another country. The potential institutional, financial and operating frameworks that will arise from Brexit suggest a wide range of possible outcomes. The process, if mapped successfully, can be a positive one. The UK’s current position is not unique. In the 1980s, the government of New Zealand instigated a reform programme to transform the country’s food and agriculture sector which led to compelling long-term economic benefits.

The here and now: The design of any new policy-making framework has to begin with some macro considerations: how relevant is a subsidy-based system of agriculture in the modern era? Is food security relevant to a country with a structural trade deficit in food? To what extent should environmental considerations influence the policy-making agenda? What is the role of government in terms of regulation, environmental compliance security, supply and food trust?

The future is another country. The future of British agriculture lies not in inefficient subsidies and misallocated capital. Rather, the UK has the potential to re-pivot, refocus and redeploy its capital and energies towards the nation’s value-added agricultural technologies and cutting-edge science capabilities. The potential benefits to the country are not simply economic and commercial; they can also reinforce trade, aid and economic
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Executive summary
The possibility of a Brexit-driven reconfiguration of the UK’s food and agricultural sector suggests that a period of significant transformation and structural adjustment lies ahead. Set against an industry already in the midst of rapid technological displacement, value-chain disruption and regulatory change, a transformative event such as Brexit appears to add to existing uncertainty.

However, while the potential institutional, financial and operating frameworks that will arise from Brexit suggest a wide range of possible outcomes, the process, if mapped successfully, can be a positive one. The UK’s current position is not unique. In the 1980s, the government of New Zealand instigated a reform programme to transform the country’s food and agriculture sector, the results of which were immediate and painful as well as long-term and beneficial.

At the core of the transformation that shook New Zealand’s agriculture sector in the 1980s and 1990s was a pressing need to access new markets in the face of external economic shocks and structural adjustments, such as the UK’s decision to join the then European Economic Community (EEC) in 1973. While there are obvious direct parallels between the New Zealand case study and Brexit, both situations remain distinct and unique. The first section of this report “The past is another country” considers the New Zealand experience and argues that an agenda focused on long-term goals can deliver significant economic and social benefits, but may come with considerable short-term costs. The battle about to commence is set to be as brutal, complex and ideological as that which determined the direction of the British economy in the late-1970s and early 1980s.

The second part of this report “The here and now” considers the Common Agriculture Policy (CAP), the defining policy feature of the UK’s agriculture landscape over the past few decades. The design of any new policy-making framework has to begin with some macro considerations, not least: how relevant is a subsidy-based system of payments in the modern era? Moreover, what is the relevance of food security in a country with a structural trade deficit in food? We must also consider to what extent environmental considerations should influence the policy-making agenda. What is the role of government in terms of regulation, environmental compliance, bio-security and food trust? Alternatively, can a free-market, liberalisation agenda deliver wider social, political and environmental objectives as well as economic goals? Can the UK use its fledgling – and flourishing – agtech knowhow to raise productivity, build exports and deliver value added to the British economy?

The third part of this report “The future is another country” peers into the future, and presents some innovative and strategic thoughts. As a study it is neither exhaustive nor academic, but it does cover many of the key and very real issues that come up time and again in our daily work with clients. It simply considers some of the strategic directions that the UK should consider if it wishes its food and agriculture sector to prosper. A global imperative is: how do we feed a world of 10bn people within a generation when its current needs are delivered by an army of unsophisticated and undercapitalised smallholders? We contend that the Department for the Environment, Food & Rural Affairs (DEFRA) and the Department for International Development (DFID) need to shift their respective – and parallel – focuses on agriculture subsidies and development aid to collude with the Department for International Trade (DIT) and the Foreign & Commonwealth Office (FCO) to bring much of the UK’s technological, commercial, developmental and diplomatic ambitions in food and agriculture under a joint strategy.

The aim of this report is to consider some of these issues. We begin with the New Zealand case study.
The past is another country
The actual past is brittle, ever-dimming and ever more problematic to access and reconstruct: in contrast, the virtual past is malleable, ever-brightening and ever more difficult to circumvent or expose as fraudulent – Cloud Atlas, David Mitchell

In this section, we take a case-study approach to the mid-1980s economic reform programme in New Zealand. Drawing on potential parallels with what faces a post-Brexit UK, we consider how a country with a similar agricultural legacy has navigated such a dramatic transition in its agricultural mindset. We assess the impact on agriculture of the removal of subsidies, currency devaluation, and the loosening of foreign-exchange controls. We explain why a consequent fall in the number of farms and in the area cultivated was not necessarily a bad thing, and map the diversification and evolution of outputs, and consequent gains in productivity and efficiency. Further, we examine the changes to the role of Producer Boards, and outline how these have encouraged both competition and innovation.

New Zealand’s 1984 reforms
In the mid-1980s the New Zealand economy was radically reformed under the Labour Administration of David Lange and his finance minister Roger Douglas. Dubbed “Rogernomics” by many commentators – the reforms resembled those taking place in the UK and the US over the same period. There was, however, one distinct and notable difference: the emphasis on structural reform was placed on New Zealand’s relatively large agricultural sector, in contrast to the industrial emphasis which was the hallmark of the UK and the US programmes.

In common with Britain’s reluctance to restructure industries (shipbuilding, mining, steel, automotive) which had changed beyond recognition in the post-War era, New Zealand’s agriculture sector had continued to rely on exports to markets that had undergone wholesale change over time. At the heart of these structural adjustments was the UK’s entry to the EEC in 1973, which had a significant impact on New Zealand’s traditional market for agricultural products. However, the policy response of consecutive New Zealand administrations – mirroring the Keynesian consensus of that time – had focused on subsidy rather than liberalisation, restructuring and reform.

In response to a severe fiscal crisis, which was being compounded by the economic woes wrought by oil crises, inflation and falling productivity, New Zealand introduced a series of supply-side reforms in 1984, chiefly:

1. A 20% devaluation of the New Zealand dollar (NZ$)
2. Financial market deregulation and removal of foreign exchange controls
3. The removal of subsidies and tariff protection across many industries
4. A reduction in top marginal tax rates
5. Introduction of goods and services tax (GST)
6. The privatisation of many government assets

The removal and substantial reduction of various agricultural subsidies were a hallmark of the 1984-1989 Lange Administration. This led to greater international competition, the loss of thousands of manufacturing jobs and to a number of farmers losing their farms. The abolition list included price support and income support, and subsidies for fertilisers, irrigation, transport and land development. In addition, farmers lost tax concessions and free government services. Finally, Producer Boards lost concessionary funding from the Reserve Bank of New Zealand. To support farmers through these
structural changes, government assistance came in the shape of loan restructuring and social welfare payments

**New Zealand’s economy in the 1970s and early 1980s**

In the 1950s and early 1960s, New Zealand was among the richest nations in the world, with a per capita GDP above that of most OECD countries. Its economy was driven by the primary sector, especially exports of wool, meat and dairy products. Britain was the destination for most of these and accounted for over half of New Zealand’s total exports during that period – hence New Zealand’s moniker as “Britain’s farmyard”.

The economy during the period – in common with the Post-War Keynesian Consensus across the West – was highly interventionist. Government was heavily involved in managing aggregate demand through a wide range of fiscal and policy measures. The state directly exercised control of labour, product and financial markets and used currency devaluation as a means to support demand. Tariffs were also kept high to encourage domestic industries. While hardly alone in following such policies, New Zealand embraced intervention with enthusiasm.

During the 1960s and 1970s, New Zealand enjoyed robust growth, thanks to favourable terms of trade and strong global growth across the West. However, its relative position among developed nations deteriorated and living standards fell behind its developed-economy peers.

The first major shock arose with the widespread proliferation of synthetic fibres, which had a devastating impact on wool prices. In 1967 greater competition from these man-made fibres pushed wool prices down by 30%. The decline exposed New Zealand’s vulnerability due to its dependence on a narrow range of agricultural export commodities. In 1973, a further shock followed when OPEC raised oil prices twice in short succession, moves which had a devastating impact on the terms of trade. The country’s adoption of centralised-wage and price-setting mechanisms meant New Zealand reacted slowly to these external shocks.

In addition to the damage wrought by these external events was the accession of the UK to the EEC in 1973. The implementation of the Common Agricultural Policy (CAP) in the UK severely restricted New Zealand’s access to its core export market. Britain’s share of New Zealand’s total exports fell from approximately 31% in 1972 to 20% in 1977. The OPEC-driven oil price hike in 1979 would only worsen the situation, and wide trade imbalances followed.

Reduced access to British markets spurred New Zealand to diversify its trade partnerships and it extended its reach to the US, Japan and Australia. In 1980, no export destination accounted for more than 20% of New Zealand’s exports. The Closer Economic Relations (CER) agreement signed in 1983 with Australia brought the two countries’ domestic markets closer. However, this did not diversify export content and New Zealand still depended heavily on a few key agricultural commodities.

By 1984, these external shocks coupled with internal market distortions contributed to severe macroeconomic imbalances. The current account deficit reached almost NZ$2bn – some 5% of GDP. The fiscal deficit deteriorated to 9% of GDP. Simultaneously, the unemployment rate crossed 4%, having largely remained below 2%. Public debt was rising and growth was weak.
Figure 1  New Zealand’s key economic indicators (1970 – 1984)

Source: Department of Statistics, Dalziel and Latham 1991, New Zealand Official Yearbook, Appendix to the Journals of the House of Representatives
The advent of Rogernomics

Faced with a range of unpalatable choices, New Zealand, under Finance Minister Roger Douglas, embarked on wide-ranging structural reforms, including devaluation of the currency, loosening of foreign-exchange controls and the reduction or removal of sectoral subsidies and tariffs. The New Zealand dollar was devalued by about 20% initially and, in March 1985, the exchange rate was allowed to float freely with no market intervention. Financial markets were de-regulated with most restrictions on interest rates and foreign-exchange transactions removed. Regulation shifted towards a supervisory framework rather than preventive micromanagement.

Subsidies were drastically reduced or removed completely across many sectors of the economy. Similarly, tariff protection was mostly lifted, exposing domestic industry to international competition. The government also overhauled its tax regime by reducing top marginal tax rates, broadening the tax base and introducing GST. The government’s commercial activities were incorporated or privatised. A notable feature was that New Zealand became the only developed world nation to abolish most forms of support and subsidy for its agriculture sector.

Impact on agriculture

Given the relative importance of the agricultural sector in New Zealand’s economy, especially as a foreign-exchange earner, the macroeconomic and regulatory reforms delivered sweeping changes across the sector as well as the wider economy. However, many policy initiatives specifically targeted the agriculture sector. Among the changes which took place during the Lange Administration’s tenure between 1984 and 1989 were the removal and substantial reduction of agricultural subsidies. These included price support and income support, subsidies for fertilisers and capital-based subsidies on irrigation, transport and land development. In addition to these subsidies, farmers lost tax concessions and other government services previously provided free of charge. Finally, Producer Boards lost concessionary funding from the Reserve Bank of New Zealand.

The Ministry of Agriculture and Fisheries’ expenditure was at a peak of 13% of farm-sector output value in 1984. After a few years of reforms, the number came down to 2%, demonstrating the scale of change experienced across the agricultural sector.

Not all measures were negative. Devaluation of the New Zealand Dollar made farmers’ exports more competitive, and the removal of import tariffs reduced some input prices. However, loss of income support, higher interest rates and rising inflation meant that the overall effect was negative.

Consolidation

Some of the key effects of these drastic reforms can be summarised thus:

1. By some estimates, before the reforms were introduced in the mid-1980s, nearly 40% of the average New Zealand sheep and beef farmer’s gross income came from government subsidies, all of which was withdrawn suddenly.

2. The number of farms fell from approximately 80,000 in 1984 to 60,000 by 2012. Official predictions at the time believed that some 8,000 farms would fail. However, eventually, only some 800 farms – or 1% of the total number – faced forced sales.
3. Simultaneously, New Zealand’s total agricultural area fell. This decline in total agricultural area is most likely attributable to the withdrawal of marginal land from agricultural activity, as an absence of subsidies rendered economic returns impossible.

In terms of the distribution of farm size, the number of small farms and large farms has increased, while the number of medium-sized farms has declined. The rise in the number of small farms might seem like a paradox given their relative inefficiencies and the lack of scale economies. However, the evidence suggests that this uplift in small farms is driven by (i) diversification into horticulture, which requires considerably less area than pastoral production and (ii) a rise in alternative lifestyles, i.e., farmers with other sources of income such as second family jobs, tourism opportunities and so on. The trend changed slightly after 2002 when the number of small farms started to decline. This most likely reflects the continuance of the consolidation theme and an element of capitulation among small farms.

At the other end of the spectrum, numbers of large farms declined initially, and then increased, most likely due to consolidation. This goes some way to explain the “disappearing middle” and the reduction in medium-sized farms.

![Figure 2 Farm distribution by size](image)

Source: Statistics New Zealand, New Zealand Farm Structure Change and Intensification, Stephanie Mulet-Marquis, John R. Fairweather

Note: Numbers for 1984 and 1990 are approximate

Consolidation in the dairy and beef sub-sectors has become a defining theme in the past 30 years. In 1984, there were some 16,000 herds across New Zealand. By 2014, this number had declined to 12,000. However, over the same period, the average herd size tripled from approximately 140 to 420 cows per herd. Although herd numbers have increased in the past few years, the rise has been marginal.
Figure 3  Evolution of dairy herds and herd size (1985-2016)

Source: NZ Dairy Statistics, 2015-16

Change in output
These agricultural reforms affected each sub-sector differently. Figure 4 below shows the gross production value for several key crops. Broadly, the dairy sector declined in the years following the reforms, but rebounded sharply thereafter. However, the sheep/wool sector saw a steady and prolonged fall over many years. This was not entirely due to the reform programme but also due to the general decline in wool demand with the rise of synthetic textiles. Over the same period, the output of key fruits increased gradually, an indicator of diversification into higher-value foodstuffs.

Figure 4  Gross production value of key commodities (constant 2004-2006 US$m)

Source: FAO

The above chart relates to value and so combines both volume and price. Figure 5 below shows only the volumes and paints a similar picture.
Horticulture increased substantially, with the production of key fruits such as apples and kiwis demonstrating consistent growth.
Diversification

As we noted previously, there has been a rise in the number of small farms in New Zealand. This has been driven, in part, by diversification. Thus, while growth in rural tourism has foundations in the globalisation trends of the 1990s, it also has some roots in the 1980s agricultural-reform programme. The rise of horticultural farms also reflects the level of diversification. The previous chart illustrates the rise in production of horticultural commodities. The following chart shows the rise in area harvested for apples, grapes (wine) and kiwifruit, the three major horticultural exports of New Zealand. Grape output, in particular, has risen dramatically over the years.

**Figure 7**  Harvested area of key horticultural crops (ha)

![Graph showing harvested area of key horticultural crops](image)

*Source: FAO*

New Zealand’s horticultural products are mostly export oriented, and have nearly doubled their share of total merchandise exports over the past three decades.

**Figure 8**  Horticultural exports / total merchandise exports (%)

![Graph showing horticultural exports](image)

*Source: FAO*
Productivity and efficiency gains
Multifactor productivity in New Zealand’s agricultural sector has improved at a faster rate than before the reforms and also faster than in other parts of the economy since 1984.

**Figure 9**  Annualised multifactor productivity growth by sector

Similarly, since the removal of subsidies, farmers have applied fertilisers more efficiently, bringing consequent benefits to the environment. Furthermore, farming on marginal and infertile land has declined.

Since 2003, NZ$-denominated commodity price increases have largely been lower than world price increases. In other words, the NZ$ exchange rate has actually reduced the benefit from high commodity prices. Despite this, exports have still increased, primarily on the strength of widespread productivity gains across the agriculture sector.

**Figure 10**  NZ$ real trade-weighted index, monthly (Indexed Jan 1984 = 100)
As the following table shows, in a post-reform environment, despite subsidies to the livestock sector wholly disappearing, average farm GDP continued to grow steadily, reflecting higher productivity.

**Figure 11 Fiscal costs of support in pastoral agriculture (average for each period in NZ$m)**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Support prices</td>
<td>209</td>
<td>47</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fertiliser subsidy</td>
<td>49</td>
<td>9</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Interest transfers</td>
<td>136</td>
<td>186</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Marketing-board debts</td>
<td>132</td>
<td>158</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Tax transfers</td>
<td>73</td>
<td>54</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Inspection services</td>
<td>49</td>
<td>46</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Advisory services</td>
<td>10</td>
<td>13</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Research services</td>
<td>38</td>
<td>54</td>
<td>59</td>
<td>61</td>
</tr>
<tr>
<td>Quarantine services</td>
<td>27</td>
<td>34</td>
<td>35</td>
<td>48</td>
</tr>
<tr>
<td>Other</td>
<td>49</td>
<td>76</td>
<td>14</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>772</td>
<td>677</td>
<td>116</td>
<td>115</td>
</tr>
<tr>
<td><strong>Average farm GDP</strong></td>
<td>2,356</td>
<td>3,619</td>
<td>4,660</td>
<td>5,052</td>
</tr>
<tr>
<td><strong>Transfers as % of farm GDP</strong></td>
<td>32.7</td>
<td>18.7</td>
<td>2.5</td>
<td>2.3</td>
</tr>
</tbody>
</table>

*Source: Ministry of Agriculture, Wellington, via New Zealand’s Agricultural Reforms and their International Implications, R.W.M. Johnson*

**Employment**

Conventional wisdom would have it that technological innovation coupled with reduced access to existing markets would have a detrimental impact on overall employment. Evidence suggests that this is not necessarily the case. Average annual employment growth in accommodation and food services registered an annual growth of 2% between 1989 and 2012, despite these sub-sectors’ reliance on a low-wage workforce. Although the conventional wisdom could be applied to primary production where overall employment fell, the fact that employment rose across the wider sub-sector would suggest that the benefits of the reform process had a positive impact on the overall food value chain and associated industries (such as tourism).

**Re-pivoting imports and exports**

A key phase in New Zealand’s post-reforms period came after 2000, when the country pivoted towards Asia and simultaneously enjoyed a period of high commodity prices. This was reflected in the composition of markets for imports and exports. There was an upsurge in exports to the Asian Tigers and then, latterly towards China. Simultaneously, imports from China and OPEC countries accelerated.
Figure 12  New Zealand exports by country (NZ$m)

Source: Statistics New Zealand

Figure 13  New Zealand imports by country (NZ$m)

Source: Statistics New Zealand
Transition challenges
Despite considerable structural adjustment, wider fiscal challenges meant that government measures to assist farmers were not extensive. The government partially funded a trust, which was established to advise farmers on the viability of their farms. In addition, farmers, for whom agriculture would no longer be viable, were given a one-off grant of about NZ$45,000 to abandon farming.

The other major area of assistance was debt restructuring, both at farmer and sector levels. For example, the substantial debts of the Dairy and Meat Boards were forgiven to ensure the financial viability of both. Similarly, individual farmers also had their debts partly written-off. In total, some 7% of total farms benefitted from these measures, with each farmer reducing his or her debt by approximately one third. Finally, farmers were also provided with better access to social-security schemes that cater to the unemployed and to low-income families.

Figure 14 below demonstrates the effect that the transition had on farm incomes. In the immediate aftermath of the reforms, farm incomes declined, but recovered thereafter.

<table>
<thead>
<tr>
<th>Year</th>
<th>Value added (NZ$m)</th>
<th>% of total value added</th>
<th>Arable farms (NZ$)</th>
<th>Sheep farms (NZ$)</th>
<th>Dairy farms (NZ$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1982-83</td>
<td>2,117</td>
<td>6.8</td>
<td>15,545</td>
<td>23,395</td>
<td>20,809</td>
</tr>
<tr>
<td>1983-84</td>
<td>2,413</td>
<td>7.1</td>
<td>11,062</td>
<td>18,491</td>
<td>21,714</td>
</tr>
<tr>
<td>1984-85</td>
<td>2,973</td>
<td>7.7</td>
<td>31,847</td>
<td>34,208</td>
<td>28,047</td>
</tr>
<tr>
<td>1985-86</td>
<td>2,891</td>
<td>6.5</td>
<td>-11,840</td>
<td>15,338</td>
<td>23,756</td>
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<tr>
<td>1986-87</td>
<td>3,153</td>
<td>5.9</td>
<td>-6,752</td>
<td>25,857</td>
<td>22,700</td>
</tr>
<tr>
<td>1987-88</td>
<td>3,513</td>
<td>5.9</td>
<td>19,337</td>
<td>28,487</td>
<td>25,800</td>
</tr>
<tr>
<td>1988-89</td>
<td>3,877</td>
<td>5.8</td>
<td>13,555</td>
<td>28,257</td>
<td>52,812</td>
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<td>1989-90</td>
<td>4,280</td>
<td>6.0</td>
<td>53,854</td>
<td>37,285</td>
<td>64,410</td>
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<tr>
<td>1990-91</td>
<td>3,912</td>
<td>5.4</td>
<td>43,741</td>
<td>28,784</td>
<td>33,039</td>
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<td>1991-92</td>
<td>4,510</td>
<td>6.3</td>
<td>50,779</td>
<td>31,065</td>
<td>50,657</td>
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<td>1992-93</td>
<td>4,345</td>
<td>5.8</td>
<td>34,413</td>
<td>36,216</td>
<td>57,829</td>
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<tr>
<td>1993-94</td>
<td>4,956</td>
<td>6.2</td>
<td>48,644</td>
<td>48,702</td>
<td>59,315</td>
</tr>
<tr>
<td>1994-95</td>
<td>4,850</td>
<td>5.5</td>
<td>63,487</td>
<td>36,972</td>
<td>64,021</td>
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<td>1995-96</td>
<td>5,009</td>
<td>5.5</td>
<td>62,757</td>
<td>26,084</td>
<td>54,170</td>
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<tr>
<td>1996-97</td>
<td>4,992</td>
<td>5.2</td>
<td>57,357</td>
<td>41,220</td>
<td>43,148</td>
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<tr>
<td>1997-98</td>
<td>5,154</td>
<td>5.2</td>
<td>48,081P</td>
<td>30,857P</td>
<td>47,085</td>
</tr>
<tr>
<td>1998-99</td>
<td>5,188</td>
<td>5.2</td>
<td>37,900E</td>
<td>29,700E</td>
<td>n.a.</td>
</tr>
</tbody>
</table>

\(P = \text{provisional}, \ E = \text{estimated}\); Note: Farm incomes are measured as farm profit after depreciation but before tax

Source: Statistics New Zealand, NZ Wool Boards’ Economic Service, NZ Livestock Corporation, via New Zealand’s Agricultural Reforms and their International Implications, R.W.M. Johnson
Producer board reforms
Producer board reforms in the 1980s differed for those boards administering domestic commodities and those administering export commodities. Thus, Wheat, Milk and Poultry Boards were abolished, while Dairy, Meat and Wool Boards were only partially deregulated, a move chiefly related to the withdrawal of both price support and subsidised credit.

Although the government did write-off a part of their debts, these export-oriented boards had to finance their deficits at market interest rates. Nevertheless, they maintained centralised roles in marketing and research. For example, the Dairy Board was the only authorised exporter of New Zealand’s dairy products. This monopoly limited private companies’ ability to export on their own and consequently reduced competition.

A further set of reforms, implemented between 1999 and 2001, saw the removal of the export monopoly enjoyed by most producer boards. This included the Dairy Board and allowed free competition between the boards and other exporters. To continue research and development in the de-centralised market environment, DairyNZ was formed. Previously this had been carried out by two separate organisations, Dairy InSight and Dexcel. DairyNZ was funded by a levy on dairy farmers, which was subject to a vote every six years. DairyNZ focuses on research, training programmes, bio-security and advocating on behalf of dairy farmers. Similarly, Beef + Lamb New Zealand Ltd, is a farmer-owned, levy-funded organisation, which undertakes research, training, and advocacy.

More recently in 2009, the government initiated the Primary Growth Partnership (PGP) programme to foster innovation across the value chain in the agriculture and food sectors. The programme envisaged a partnership between government and private sector. One of the key government goals is to increase exports. Towards that end, the government plays a key role in maintaining the reputation of the “New Zealand” brand. This involves ensuring that exporters maintain high standards for food safety, bio-security and animal welfare. Some examples of current PGP projects are to:

1. Spread best practices through knowledge sharing across the avocado industry, the objective being to triple yields to 12 tonnes/ha and quadruple industry returns to NZ$280m by 2023
2. Encourage the use of prototype harvesting systems that can target specific species and sizes of fish, and ensure they are in better condition than those caught using traditional trawls
3. Promote demand-driven value chain for the red-meat industry, bringing farmers closer to processors and consumers
4. Develop tools and software to improve fertiliser-use efficiency and reduce loss of nutrients into waterways and pastures
5. Improve precision application of fertiliser after remote sensing of nutrient status in hill-country farms

This concludes our review of the transformation of New Zealand’s agricultural sector. Historical analysis allows us to demonstrate the long-term model which emerged over time: a world-class, highly productive and innovative New Zealand food and agriculture sector. We would note the challenge of a professional forecaster considering a similar nascent story without the benefit of hindsight. In imagining what lies ahead, they have to extrapolate those long-term benefits rather than review them, with the near-term challenges starkly clearer than those farther down the line. In other words, it is worth considering how a commentator writing in 1984 might have foreseen New Zealand’s future.
The here and now

A person often meets his destiny on the road he took to avoid it – Jean de la Fontaine (1621-1695)

In this section, we look beyond ideas of pastoral tradition and rural nostalgia to present a candid view of the UK agri-food sector’s current position. We illustrate the country’s dependence on imports, and on trade in general with EU countries. We note that agriculture accounts for more than one-third of total annual EU expenditure, and debate whether this promotes trade and the opportunity for lower-cost production elsewhere. We critically assess the enormous influence of the CAP, both in the EU and the UK, and highlight what might be learned from the New Zealand experience, as the UK considers a post-subsidy landscape.

UK agriculture

It is somewhat ironic that most discussion of the UK’s future commercial relationships with the EU has focused on key industrial sectors (eg automotive, finance and business services). Paradoxically, 40% of the EU’s budget is spent on food and agriculture. Agri-food is a hugely important sector in the UK too, and we would highlight:

1. The UK’s agri-food sector contributed £108bn or 6.8% to national Gross Value Added in 2014.
2. The sector employs almost 4m people and accounts for 13.5% of national employment.
3. In 2015, food and drink exports amounted to £18bn, while imports amounted to £39bn. Trade with the EU accounted for some 60% of exports and 70% of imports.
4. Almost half of the food consumed in the UK in 2015 was imported; the EU accounted for 29% of total UK domestic consumption.
5. EU subsidies via the Basic Payment System (BPS) are scheduled to remain in place until 2020.

Food and drink trade

In 2015, UK food and drink exports amounted to £18bn, while imports reached £39bn, implying a deficit of over £20bn. The deficit has widened substantially in the past decade or so. Moreover, all major categories except “Drink” are in deficit – with “Fruits and Vegetables” and “Meat” showing significant trade shortfalls.
This dependence on imports is also reflected in the UK’s self-sufficiency ratio, defined as total food production (including exports) as a percentage of total domestic consumption. This ratio has steadily declined over the past two decades and currently stands at 61%. The self-sufficiency ratio for indigenous food types (i.e., food that can be grown in the UK) is higher at 76%, but has similarly declined over the past two decades.

Another way to look at the UK’s dependence on imports is to consider the break-up of domestic consumption by region of origin. As the following chart illustrates, the share of UK-produced food in domestic consumption has declined consistently over the past couple of decades and is now at just above the halfway mark. Over the same period, the share of food imports originating from the EU has increased from 18% of the total in 1990 to some 29% of the total. Many factors explain this shift: the
implementation of the Single European Act in 1987, growing affluence across the UK, changing consumer tastes and even the growth in foreign-born population.

**Figure 17  Origins of food consumed in the UK**

In the context of Brexit, UK trade with EU is particularly relevant. In 2015, 60% of UK food exports went to the EU, while 70% of its imports were from the EU. More specifically, seven of the top ten countries that UK exported food to were in the EU, while nine of the top ten countries that UK imported food from were in the EU.

**Figure 18  UK food, feed and drink exports and imports break-up by country (2015)**

**Background to the CAP**

While the previous section demonstrates the UK’s deep trade links with the EU in the food and drink sectors, the EU’s major impact on UK agriculture is through its CAP. The CAP is a long-standing policy, implemented initially in 1962 when the EU’s predecessor, the EEC, was composed of six countries. By
1984, when the EEC comprised ten countries and two years before this increased to 12, the CAP accounted for over 70% of the EEC’s annual budget. Even with four enlargements since 1984, the CAP still accounts for almost 40% of the modern EU’s budget. In short, agriculture accounted for almost €55bn of the EU’s annual €145bn budget in 2016.

The Common Agricultural Policy

The CAP was introduced to ensure that agriculture in the EEC, now the EU, remains sustainable and competitive, allowing farmers to fulfil their function in society. The fundamental objectives of the CAP have remained constant since its implementation in 1962; these are to:

• increase agricultural productivity
• ensure a fair standard of living for the agricultural community
• stabilise prices
• ensure the availability of supplies
• ensure supplies reach consumers at reasonable prices

Among several reforms, those of the “Agenda 2000” added rural development (pillar 2) to production support (pillar 1). In essence, EU funding is used to provide income support to farmers to protect against market volatility and the vagaries of climate. In return, farmers must comply with certain requirements, which mainly comprise maintaining standards of health and welfare of crops and livestock, and of the public they supply. The CAP intervenes in markets, and is responsible for issues relation to the marketing and international trade of agricultural products.

Source: European Commission on Agriculture and Rural Development

There have been many attempts to reform the CAP over the years. The system has always been difficult to repair because of the influence of assorted vested interests and various pressure groups. Reform only seems to become possible when the system reaches breaking point or when another pressure group emerges to counter against those behind farmers, eg, the rise of the 1980s environmental movement, which helped to reclaim some of the initiative for the reformers. It would not be trite to summarise this as anything less than a conflict between urban and rural cultures. An additional pressure was the 1986 Uruguay WTO round which brought agricultural subsidies into negotiations for the first time.

Reforming the CAP

Price-support mechanisms eventually gave way to quotas in 1992 when the MacSharry reforms were introduced. As a result of these reforms, overall price-support levels declined and land was taken out of production through the introduction of the “set aside” scheme. These were ambitious moves in that they covered the economic case to bring market disciplines to bear upon the system, introduced greater environmental compliance into the agriculture sector and also acknowledged the social effects of these reforms through new systems designed to ease farmers out of farming.

The MacSharry reforms were taken a stage further with the adoption of the Single Payment Scheme (SPS), which was implemented in 2003. The fundamental shift was to break the link between subsidies and output, and pay farmers according to the amount of land they farmed. In short, the decision as to what crop was produced was based on decisions made by the farmer rather than the EU bureaucracy.

The SPS also reinforced environmental standards. To qualify for grants disbursed by national governments some 8% of land had to be “set aside”. The SPS greatly simplified the bureaucratic
challenges and replaced 11 EU schemes with a single model. That did not prevent administrative problems when the system was initiated.

**CAP support statistics**
The EU’s CAP operates through two pillars: pillar 1 deals with direct payment to farmers, while pillar 2 focuses on rural development. Pillar 1 payments are primarily based on land area, but also include components that promote environmentally friendly practices, encourage young farmers, support areas with natural constraints and so on. Pillar 2 payments are geared towards supporting rural development, including the preservation of ecosystems, conservation, promotion of efficient use of resources, and social inclusion.

The CAP payments for pillar 1 are funded through the European Agricultural Guarantee Fund (EAGF) and for pillar 2 through the European Agricultural Fund for Rural Development (EAFRD). Over 2014-2020 the UK is set to receive €27.9bn in pillar 1 and 2 payments – about £3bn annually. In 2015, including both pillars, CAP payments in the UK amounted to £2.8bn. Over the past few years, payments have been around £3bn annually.

**Critiquing the CAP**
While we might consider Brexit, and perhaps the Euro, as major components of the EU debate, criticism of the CAP pre-dates both subjects by decades. While the CAP has evolved, in an attempt to counter the criticisms levelled at it, there is an underlying consistent thread of criticism which has transcended the “old CAP”, which was a hallmark of the EEC, and the “new CAP”, which governs the current EU landscape.

Among the criticisms of the CAP are that it:

- **Reinforces market distortions.** At the heart of the CAP conundrum is the inefficient allocation of capital. Capital should aggregate in sectors where it can make the highest possible returns. Clearly this is not the case for agriculture. Arguably, these resources would be better distributed towards other commercial sectors.

- **Inhibits free trade.** One glaring set of distortions to free trade can have repercussions across other industries. Consider the 12 long years that elapsed from the point of initiation until Canada and the EU signed their Comprehensive Economic Trade Agreement (CETA) in 2016; likewise the current Doha round of the WTO talks, which includes agriculture. These talks were initiated in November 2001, since when almost 185 months have elapsed with no likelihood of ratification any time soon. Contrast that with the seven previous rounds, which totalled 234 months of negotiations.

- **Creates social injustice.** The scale of administrative burden associated with the CAP means that it is not poor farmers who benefit from it. Rather, some 20% of recipients receive up to 80% of support funds – with such recipients including “farmers” such as the Queen, a few Dukes and Earls, and a few billionaires. An additional argument, which takes this criticism one step further, is to query whether funds should be expended at a specific industry or at the poor generally.
• **Promotes environmental degradation.** A considerable proportion of the annual CAP budget (c. €12bn) is spent on addressing biodiversity loss, monocultures and carbon sequestration. However, this contrasts with an overall annual budget of €55bn, indicating the extent to which the EU focuses on output rather than environmental measures.

• **Lessens food security.** Food security has become a great geo-strategic issue of our age. We have already noted that China’s changing dietary habits means that – within a decade – the country will require an additional annual 90m tonnes of grains and oilseeds to service that shift, the bulk of which will have to be imported. Meanwhile, Africa has its own US$40bn agricultural output deficit. Subsidised, high-cost agriculture in the EU does little to promote trade and low-cost production elsewhere. It could arguably be asserted that the EU actually promotes food insecurity in the developing world.

• **Promotes negative image of the EU.** The unpopularity of the EU has many fathers but, as the biggest component of the annual EU budget, the CAP is seen negatively by many of its highly urbanised citizens. In an era of constrained budgets and more polarised politics, the CAP is an easy target.

**The CAP in the UK**

Let us put CAP payments in perspective: note that the total income from farming in the UK in 2015 was £4bn – so, about 70% of total farming income arose from subsidies. That said, it could be argued that not all CAP payments should be treated as subsidies. Some, especially those related to agri-environment schemes should be considered as compensation for carrying out activities that benefit the environment – for instance planting woodland, or support for Less Favoured Areas (LFAs). Excluding those, direct subsidies are essentially Basic Payment Scheme, Greening payments, Youth Farmer payments, and a couple of production-linked schemes in Scotland. These direct subsidies to UK agriculture in 2015 were about £2.2bn, or 55% of total farming income.

**Figure 19   UK CAP receipts from the EU budget (£m)**
Figure 20 below shows the contribution of total subsidies and direct subsidies to total income over the past five years.

**Figure 20  UK total income from farming and contribution from subsidies**

![chart showing total income from farming and contribution from subsidies for the UK over five years](chart)

The dependence on subsidies is even stronger for Wales and Northern Ireland, as shown in Figure 21 below.
While the above discussion looks at farming income in the aggregate, we should also consider income at farm-level. Figure 22 below shows the break-up of average farm business income for different types of farms in England in 2015/16. The total income is composed of four streams: (a) agriculture – income from crops and livestock; (b) diversified income – from activities such as letting out buildings, processing, retailing, sports, recreation, tourism, renewable energy, etc; (c) Agri-environment payments – subsidies for preserving and promoting the environment; (d) Basic Payment Scheme – direct subsidies.
As can be seen, most farms in England, except specialist poultry, dairy and horticulture, made substantial losses or only marginal gains from their core agricultural activities. While diversified activities provided some positive income, subsidies were the major contributor to most farms’ incomes. For some, such as mixed farms and grazing farms, subsidies made up nearly 150% of farm business income.

**Figure 23**  England – subsidies contribution to farm business income by farm type, 2015/16

![Subsidies contribution to farm business income by farm type, 2015/16](chart)

Similarly, most farms in Scotland and Northern Ireland depend on subsidies for a very large percentage of their farm business income, as seen in the chart below. Given this high dependence on subsidies, agricultural policy post-Brexit should be a major concern for British farmers. The UK government has guaranteed funding until 2020 for projects currently funded by the EU, including agricultural subsidies.
Lessons for the UK post-Brexit

The contrast between the British and New Zealand experiences

The New Zealand reforms in the 1980s were a response to a severe fiscal crisis. Agriculture reforms were part of a wider economic reform programme that encompassed financial-market deregulation, privatisation of government assets and so on. The challenges of Brexit are – at this stage – not comparable. EU support to the UK agriculture sector is approximately £3bn annually, which is small beer when contrasted with a tally of £784bn government expenditure. In short, the justification for agricultural reform has to centre on many non-fiscal considerations, such as productivity and efficiency.

New Zealand is a net agricultural exporter and, according to the FAO, had an agricultural trade surplus of US$18bn in 2013. Even in the early 1980s, before the reforms, New Zealand was a major exporter with an annual agricultural trade surplus of about US$3bn. Contrast that with the UK’s £20bn agricultural trade deficit in 2015. Thus arguments based on self-sufficiency and food security will carry greater resonance in the UK, than in New Zealand during the case-study period.

A further factor that may distinguish the two landscapes is the external environment. New Zealand benefitted from strong demand growth across rapidly growing Asian markets, specifically China. This was also underpinned by a significant commodities boom that did not exist in the 1980s and 1990s during the early years of the NZ reform programme. This obviously had a significant – and beneficial – influence on New Zealand’s food and agricultural exports. That conditions are wholly different now would be an understatement. With relatively low commodity prices, an eradication of subsidies would have to be met with rapid and robust productivity improvements to bring down costs.
A notable key difference between the UK and New Zealand is the power and mandates of the respective governments. The Lange Administration, in a unitary state with a unicameral legislature and with a first past-the-post electoral system, won almost 60% of the seats with some 42% of the vote. This represented a powerful mandate and meant that the government was capable of pushing awkward legislation through parliament. In the UK, the government, a new Prime Minister, wrestles and negotiates in two legislative chambers with a working majority barely into double digits across a country, which, in agricultural terms, is no longer a unitary state.

Notwithstanding these differences, some broad similarities do exist between the UK’s current position and the New Zealand experience. As we have already outlined, both countries have heavily supported agriculture sectors and both have strong research, development and technological capabilities.

New Zealand’s agricultural sector, broadly speaking, witnessed three distinct periods during which external factors played a part in the sector’s overall development. The first was the era of technological transfer between the mid-1950s and the early-1970s when rapid growth in the Industrial West had a positive effect on New Zealand’s export-driven model. This was followed by the triple shocks of the 1973 oil crisis, the UK’s decision to join the European Economic Community (EEC), the forerunner to today’s EU, and a prolonged period of low growth across the Industrial West. The third phase can be described as the “Post-reform era” and, particularly post-2000, when the country re-pivoted towards Asia and also enjoyed a period when commodity prices remained high for a prolonged period.

This second phase is highly relevant to the UK today. The Industrialised World – a wider term now than was the case in the early-1970s – remains mired in a lengthy period of sub-par economic growth which was brought on by a systemic shock, in this case, the Global Financial Crisis. That the UK’s agriculture sector may be about to embark on a Brexit-driven structural shift and re-pivot from its core markets strengthens the parallels with the New Zealand experience in the 1980s. What ought the future agricultural landscape look like?

At the very least, the UK should be reassured about the potential for genuine recovery, re-growth and indeed renaissance in a post-EU subsidy environment. The UK has an opportunity to take a world-leading role in the development and provision of agricultural technologies and value-added services, marrying the legacy of thousands of years of agricultural cultivation with a prodigious capacity for innovation and inventive application.
The future is another country

*There is always a moment in childhood when the door opens and lets the future in* – The power and the glory, Graham Greene

In this section we take a fresh, ambitious look beyond the potential for reactively tweaking existing agribusiness systems. We examine objectively and boldly the global picture of food requirement and production, and the very real geo-political challenges that inhibit progress. We distill our considerable experience of working across different emerging economies to present the opportunities to create new breadbaskets, and the issues facing potential investors. We make a clear case for the development and promotion of the UK’s burgeoning agtech sector, and assess how more effective and co-ordinated efforts from pertinent UK government departments might fulfil both commercial and societal objectives.

**Out in the big wide world**

As a food-deficit nation, a member of the EU, and a beneficiary of the CAP, the UK’s agribusiness focus – in the face of widespread restrictions on free trade in agriculture – has centred on Europe. In reality, it is developments beyond the EU, which will dictate the future of this country’s food and agriculture sector. For many years now, commentators have chronicled the unrelenting shifts in food demand across the world. We have written frequently about China and other nations to demonstrate this effect. This is a theme that applies to many other emerging economies but, for the sake of those who may not be familiar with our work, here are a few statistics worth highlighting again:

The average Chinese eats some 60kg of meat a year, an increase of 14kg from 2003 when some 46kg per person was consumed. If Chinese meat consumption mirrors other developed Chinese societies over time, we can assume Taiwan’s current 76kg consumption is a realistic long-term extrapolation. To satisfy this increase, China will require an additional 90m tonnes of feedstock grains and oilseeds. In turn, this will require an additional 15m hectares of agricultural land – an area the size of England and Wales – which China simply does not have.
These demand pressures have been augmented by supply-side constraints such as diminished farmland, polluted rivers, depleted aquifers, overuse of fertilisers, unclear ownership of farmland and an archaic legal code. Fixing these takes time, capital and effort, which is why the Chinese government is tackling these challenges with a broad range of measures. Recent policy schemes include the liberalisation of leasing activity, the promotion of large-scale mechanised farms, addressing land and water pollution and the restructuring of agricultural subsidies.

Given the intensity of domestic supply pressures, where will the likes of China and other emerging economies source their future food supplies? Where are the opportunities for large-scale agricultural cultivation?

- **Confederation of Independent States (CIS).** In the early 1990s, the collapse of the Soviet Union and the dissolution of its collective farming model led to a massive withdrawal of productive farmland. Estimates vary but anywhere between 20-40m hectares of land went out of production once the reforms of then Prime Minister, Yegor Gaidar, were introduced in 1992. It would be easy to assume that this is where future supplies might come from, given that a rehabilitated 20m hectares of land can easily provide 100m tonnes of assorted grains. The reality is somewhat more challenging: Black Sea Ports lack the capacity to export these amounts. In 2015, some 45m tonnes of wheat were exported via the Black Sea. Quite simply it isn’t enough. Moreover, the long lead times for capital investment in jurisdictions where there is conflict and the lack of a proper rule of law ensures that there is limited scope for greater supplies to emerge from the countries which make up the CIS.

- **Central Asia.** Landlock, low yields and a poor investment climate all combine to make various Central Asian republics challenging environments to provide for the long-term food needs of industrialising countries. “China’s One Belt, One Road” policy which, among other geographies, brings various Central Asian republics into China’s orbit, is an acknowledgement of China’s need to secure strategic long-term resource needs including food. Whether it can deliver the step change in supply required, given the logistical, agricultural and financial challenges involved, is arguable.

- **Latin America.** Latin America would seem to be an obvious future source of strategic food supplies for much of the world, not least China. One only needs to look at China’s growing demand for soybeans over the past two decades to understand how important Brazil has become as primary producer for the Middle Kingdom. In 1995/96, China imported less than a million tonnes of soybeans (while producing 14m tonnes domestically). A couple of decades later this had accelerated to 83m tonnes. Notably, China’s own domestic production was static over that period. Over the same period, Brazil’s exports of soybeans increased from about 2m tonnes to 54m tonnes. Neighbouring Argentina – with a new reformist government, a New York court settlement with holdout bondholders and the 2002 Convertibility System collapse now firmly behind it – can also add incremental capacity to growing international needs for grains and oilseeds. However, this comes with a caveat attached. In 2008, the global food crisis led a number of key grain and oilseed exporting countries to impose export restrictions. Dependence on a few exporting countries for strategic food needs – especially those where domestic inflationary pressures can lead to export bans – is not a wise policy. In short, Latin America can supply, but just as Western nations are keen to diversify their strategic energy needs from traditional sources, the same logic applies in emerging economies with regards their strategic food needs.
Africa. Africa is a clear game changer. Not only does the Continent include the great resource of the 400m-hectare Guinea Savannah, it is also inefficiently farmed in the extreme. Yields are a fraction of what is possible, and the Continent has become a considerable food importer. Overall, Africa's food deficit is estimated to be around US$40bn. In an era where resource prices have collapsed and demographic shifts will propel the Continent's food needs dramatically in the years ahead, this is not sustainable long-term. Moreover, to develop the Guinea Savannah, which covers multiple countries in Sub-Saharan Africa, requires considerable capital investment if Africa is to reverse its own structural food deficit, supply its own demographic bulge and become a key supplier of food needs elsewhere.

All of the above demonstrate some fairly self-evident and uncomfortable truths: the most compelling long-term growth opportunities in food and agriculture are located in jurisdictions where it is challenging to invest and where major supply bottlenecks are a given. It would be ideal to think that, against this backdrop of growing affluence and positive demographics, the UK’s agriculture sector can take advantage of these shifts. However, the sheer capacity for British farms – and indeed those in other developed markets – to increase output and fulfil growing global demand is a non-starter. In farming terms, Western Europe and most other developed markets cannot increase output on the scale required to fulfil overseas food needs.

This does not mean that the UK does not have a significant role to play in increasing global food production. We believe there is another strategy open to the UK, which could allow the country to glide from an EU-focused strategic mindset and towards one centred on other international markets. This strategy should use government as an enabler and it may allow the country to dominate an industry of the future.

Agtech: joining the dots
To feed a world of some 10bn people, according to the United Nations' Food and Agriculture Organization (FAO), almost 77% of the additional output from farming will come from intensification and higher yields; only 20% will come from increased farming area. In other words, farming output growth in the future depends critically on the greater use of agricultural technologies, ranging from equipment to genetics. In a sense, it confirms what we noted above: that delivering additional supply from new land will prove to be challenging.

![Figure 25 Sources of growth in crop production (2005 – 2050E)](image-url)
Furthermore, environmental pressures such as climate change, soil degradation, water scarcity, loss of biodiversity and so on, threaten food security and require agriculture to be more adaptable and resilient. Here too agricultural technologies can help.

The UK government estimates that the global agricultural technologies sector is worth US$400bn. The sector is estimated to account directly for £14bn in value-added and over half a million jobs in the UK. Given its strength in agricultural research capabilities, the UK is well positioned to participate in a global agtech revolution. UK government expenditure on agtech R&D was approximately £320m in 2012/13 and government estimates for the equivalent industry R&D spend was approximately £496m.

To promote agtech, the government currently runs two major funding schemes:

1. **Agri-tech Catalyst** – A £70m fund set up by Innovate UK, DFID and BBSRC (the Biotechnology and Biological Sciences Research Council) to assist in the commercialisation of research
2. **Centres for Agricultural Innovation** – A £90m fund that supports the adoption, development and exploitation of new technologies and processes.

The Department for International Trade (DIT) encourages UK companies to export agricultural technologies to exploit global opportunities. DFID will also work to use UK’s agtech capabilities in developing countries through the Agri-tech Catalyst scheme. We consider this in some more detail in the following section.

To get a perspective of the range of services and companies already extant in the UK, consider the chart below. What it demonstrates is that agricultural support services can be divided and sub-divided into many smaller component parts. The work that the Agri-tech Catalyst does should be seen as a vital building block in developing a broader strategy, which cuts across various arms of government.
A strategy built on a coalition

If the CAP subsidy regime is dismantled from 2020, then the UK has to develop an alternative strategy, which can offset the economic and social costs that will arise from this policy. In the 1980s the restructuring of the coal mining, shipbuilding and steel industries was offset by growth in finance and other services. For some, the unpalatable nature of this economic restructuring was a harsh necessity; for others it was an event that to this day they struggle to come to terms with.

British agriculture may have to come to terms with a similar parallel. This time, the bifurcation will not be North and South or Manufacturing versus Services but rural versus urban, domestic versus international. In blunt terms, government strategy has to consider whether it wants to continue with a subsidy to a marginal hill farmer in the Pennines or promote world-class bioscience and technology businesses. The likelihood is that it cannot do both and, for some parties, the economic consequences will be severe.

Such a transition needs to be laid out clearly and managed carefully. As we noted earlier, in aggregate, some 70% of total income from UK farming in 2015 arose from subsidies. Removing them would mean that a large number of inefficient farmers on marginal lands are forced from the land. Farming is a traditional business and is frequently passed down from one generation to the next. Thus any transition may be harsh at both the personal and societal level. This is more so in Northern Ireland, Wales and Scotland where the complexities of Brexit have their own unique challenges and quandaries.
Simultaneously, while the UK’s dependence on imported food is likely to rise, the effect on food prices will likely be more complex. The removal of subsidies will raise the prices of domestic production but imports might be cheaper, depending on the strength of Sterling. More importantly, the contribution of farm gate prices to final consumer prices is fairly low. In 2014, gross value added (GVA) to the economy from agriculture and fisheries was £10.7bn, while the GVA across the entire food and farming sector was £108bn. In other words, primary agricultural production contributed only a small fraction of total value addition, with the remainder spread across the value chain (food and drink manufacturing, retailing, wholesaling and catering).

One part of the subsidy regime, which might have to remain in place, however, is that related to the environment. These services provide public goods for which there is likely to be market failure. For example, measures that promote flood prevention, nature protection, biodiversity, wildlife conservation and woodlands do not function along commercial lines. More to the point, politicians understandably don’t like being in front of a bank of cameras, explaining what has gone terribly wrong and what they are going to do about it.

A strategy, which diversifies UK agriculture from its current configuration and structures, will require the alignment and co-operation of the separate—and sometimes competing and conflicting interests of up to four government departments: the Foreign & Commonwealth Office (FCO), DFID, DIT and DEFRA.

**Figure 27  Coalition of the willing**

<table>
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<tr>
<th>DEFRA</th>
<th>FCO</th>
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<tr>
<td>• Diversify UK farmers into wider markets</td>
<td>• Economic Diplomacy objectives</td>
</tr>
<tr>
<td>• Take UK agri research into broader markets</td>
<td>• Developing nations focus</td>
</tr>
<tr>
<td>• £11bn ring-fenced budget</td>
<td>• Competes against China, India, Brazil and South Africa</td>
</tr>
<tr>
<td>• Act as incubator to large-scale, capital-intensive projects overseas</td>
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**International agri development**

Source: Ferguson Cardo

It makes sense to start off with an overall set of assumptions about where the UK is and tie these in with some objectives of where the country might want to be.
Britain has a large food deficit. The country needs to build its export capabilities and this is best done in commercial sectors where capital delivers the highest returns and creates the most economic value added. Subsidising agriculture may no longer make sense. The country needs to consider what are its best resources – whether technological, scientific or financial – and how best these can be combined. Such an assessment is hindered by many factors: the food and agriculture sector – excluding inputs, trading houses and the consumer end of the value chain – is notoriously fragmented. The most promising opportunities lie in the most awkward places to invest capital. An agricultural technology full of promise, struggles to get funding, let alone access challenging new markets. In short, how do you get a world-beating piece of agtech into the likes of Africa or Asia ahead of your competitors?

Therein lies the challenge. Given that many of the most promising opportunities are likely to arise in emerging economies and across an array of early-stage development projects, it makes sense to start with DFID’s activities in the sector and consider how these efforts could be translated into wider opportunities for the British food and agriculture sectors.

From aid to trade
The British Government, via DFID, disburses an annual aid budget of £11bn. This budget, one of a few protected under the previous Coalition government, has a wide development remit. DFID carries out some formidable work. However, like any organisation, it does have flaws. Its developmental goals can appear to be, if not mutually exclusive, at least distant from the everyday objectives of the private sector. There is a pressing need for the private and public to join forces.

DFID’s main aims are to address poverty and disease, mass migration, insecurity and conflict. Its overarching goal is to build a safer, healthier, more prosperous world for people in developing countries and the UK. Specifically, DFID targets British aid to promote economic growth and wealth creation, to improve the lives of women in the developing world, to prevent climate change and so on. DFID works across the world, and countries in Africa and Asia are major beneficiaries.

DFID believes that sustained wealth creation depends on the rural poor moving away from primary agricultural production. However, agricultural growth is still essential during this transition. DFID aims to achieve this through inter-related strategies of “stepping up”, “stepping out”, and “hanging in”.

1. **agricultural transformation** – growth in commercial agriculture and agribusiness development, or “stepping up”
2. **rural transition** – move away from subsistence agriculture
   a. labour-intensive manufacturing and services; boosting growth in rural non-farm economy
   b. agricultural investment as a transition strategy while prompting mobility
While implementing these strategies, DFID also focuses on women’s empowerment, food security and climate smart agriculture.

DFID’s investment in agriculture amounted to £262m in 2007/08, rising to £632m in 2011/12. Since then, it has remained at these levels.

DFID operates numerous funds, works with companies, NGOs, local governments, educational institutions and so on. Some of these funds that work closely with companies are –

1. **Africa Agriculture Development Company** (£100m over 2013-2021) – invests across the value chain in African agribusinesses to create jobs, improve food security and boost prosperity; operates in eight African countries

2. **Foodtrade Eastern and Southern Africa Programme** (£36m over 2012-2018) – operates as a trade enhancement and promotion programme focusing on staple food crops; operates in nine East and Southern African countries

3. **Business Innovation Fund** (£33m over 2008-2019) – helps the development of inclusive business models by companies in developing countries; operates in Malawi, Myanmar and Nigeria

4. **Agri-Tech Catalyst** (£10m over 2014-2023) – accelerates the development of new agricultural innovations to address food security challenges by supporting research/private sector partnerships; operates across a large number of African and Asian countries
5. **Southern Agriculture Growth Corridor Programme in Tanzania** (£44m over 2013-2018) – raises rural incomes and increase food security by contributing to improvements in the business environment for commercial agriculture in the southern corridor of Tanzania

6. **Beira Agricultural Growth Corridor** (£7m over 2011-2021) – seeks to catalyse economic activity and leverage in private-sector investment leading to accelerated job creation and income generation in central Mozambique

7. **AgResults: Innovation in Research and Delivery** (£25m over 2012-2024) – enhances smallholder welfare and food security for the poor and vulnerable in developing countries through increased investment in agricultural innovation and adoption involving private and public sector players

8. **Africa Enterprise Challenge Fund** (£20m over 2008-2018) – works to bring together private-sector entrepreneurs in Africa to innovate and find profitable ways of improving market access and functioning for the poor – especially in rural areas

These are all useful starting points. However, to what extent does the UK benefit economically from these schemes? Here, it is worth highlighting a point levelled at DFID by Ian Birrell, a British journalist and prominent critic of the department. At a public event in 2016 he questioned whether Britain’s aid budget would be better spent on offering scholarships to the young and bright from emerging economies to benefit from a British secondary or higher education. He noted how lifetime cultural ties easily translate into long-standing economic benefits too.

The same logic could be extended to DFID and agriculture. John Kenneth Galbraith’s observations in the 1960s about the growing complexity of industrial processes carry resonance today with regard to the food and agriculture sector. The growing need for technological, scientific and managerial expertise is rapidly changing the face of the food and agriculture value chains. Thus does it make sense to run overseas-aid programmes in isolation, when there are attached economic benefits which could accrue to the donor country in the long term? Would it be more strategically sensible if funding were available for overseas students to carry out PhDs at the Centre for Agriculture & Biosciences International? Or can tomorrow’s farmers in Nigeria and Bangladesh be educated at Harper Adams University or the Royal Agricultural University?

These are credible arguments for sure, but we would contend that it is only one part of the argument and DFID’s programmes do have huge relevance for the future. Traditionally DFID’s focus has been on smallholder schemes and, while valid, it has tended to ignore the structure of farming in the future. In simple terms farms are getting bigger. The authors of this report have raised capital for many agricultural enterprises across the world; some of these have covered areas the size of Oxfordshire or Derbyshire, but are not farms as the inhabitants of either of these two counties might be familiar with.

Growing capital intensity, technological complexity and financial intricacy may support the views of John Kenneth Galbraith but they are also propel the theories of another economist to the fore: Arthur Lewis, who noted – and we are paraphrasing significantly here – how as rural migration to urban areas accelerates, eventually the cheap supply of labour dries up and the rural economy is forced to swap labour for capital. In short, while smallholders will be with us for many decades to come, there is a long-term trend towards larger-scale operations and this is reinforced by rural-urban migration flows.
Addressing the funding gap through shared value

In a world where the UK food and agriculture sector, in tandem with its New Zealand peer in the 1980s, has to access new overseas markets, using DFID as launch pad or incubator becomes compelling. DFID projects have considerable capacity to widen their remit beyond smallholder schemes or small entrepreneurial groups into something much broader in scope. Secondly, DFID objectives and private-sector ambitions may be sufficiently far apart to demonstrate that a “funding gap” has opened up in emerging-economy agriculture.

The reason behind this funding gap is driven, partly, by the fact that institutional-equity investors seek out opportunities with a proven track record or, at a minimum, some proof of concept. A professional investor also requires some scale and liquidity. In short, it can be difficult to raise institutional equity or debt financing for green-field investment in challenging environments. DFID, on the other hand, has development objectives that can be at odds with those of the private sector.

The question then becomes one of marrying commercial interest and social concerns. In this context, the concept of “shared value” is pertinent. Shared value, as promulgated by Michael Porter and Mark Kramer, essentially says that a company's competitiveness is linked to the communities around it; that is, economic progress and social progress are interdependent. Some might see shared value as a sop to business interests in much the same manner that some elements of the Corporate Social Responsibility (CSR) agenda were criticised. It could be argued that the modern concept of shared value has a root in Adam Smith’s “The Theory of Moral Sentiments” which pre-dated his later tract “An inquiry into the nature and causes of the Wealth of Nations” by 17 years. In conclusion, these are hardly untested notions.

Figure 29  Creating shared value

Shared value – policies and operational practices that enhance the competitiveness of a company while simultaneously advancing the economic and social conditions in the communities in which it operates

Re-conceiving products and markets

New products and service meeting societal needs, and reaching under-served communities

Re-defining productivity in the value chain

Raise productivity while addressing societal issues in areas such as health, safety, environmental impact, etc.

Enabling local cluster development

Plug gaps in areas such as logistics, training, market organisation, educational institutions, etc.

Source: Creating Shared Value by Michael E. Porter and Mark R. Kramer, HBR

If commercial results deliver positive social outcomes then surely this is a model to continue forging. Shared value is a concept that could unify the disparate – and possibly competing – aims of DFID, DIT, DEFRA and the FCO. In our view, it would be useful to look at development projects through the
lens of shared value. Rather than taking a narrow approach and focusing solely on social outcomes, development projects must also aim to be sustainable and profitable, and vice versa.

**Figure 30  Rethinking development projects**

<table>
<thead>
<tr>
<th>Aid projects</th>
<th>Commercial projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nigerian dairy market milk collection study, by Business Innovation Facility (DFID)</td>
<td>Investor-ready business plan for Milk collection centre prepared by advisors</td>
</tr>
<tr>
<td>MADE project in the Niger Delta, Nigeria (DFID)</td>
<td>How can we turn these development projects into sustainable, return-driven commercial propositions which attract investment</td>
</tr>
<tr>
<td>Mobile phone based delivery of nutrition services in Africa and South Asia (DFID)</td>
<td></td>
</tr>
<tr>
<td>Partnership to Accelerate Agriculture Technology Transfer in developing countries (DFID)</td>
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**Agriculture as soft power: the Brazil case study**

The UK, like any first-world government, has a Foreign Affairs department focused on economic diplomacy. A government looking to establish long-term trading relationships outside of the constraints of the EU ought to deploy its development capital resources efficiently. In this context, we believe that the example of Brazil is a pertinent one to consider.

The origins of the Brazilian government’s support for outward extension of its agricultural activities (ie, beyond conventional investment and trade support and into the realms of international development) can be pinpointed on two factors. One is the strength and resilience of the resource “supercycle” which, in a country inundated with natural resources, ensured that Brazil’s government coffers were awash with capital in the first decade of the 21st century and thus capable of sustaining such activities. The other is supposedly rooted in a strategy by the previous Lula Administration, beneficiaries of these positive supercycle fiscal flows, to woo other emerging peers to support Brazil’s efforts to become a permanent member of the UN Security Council.

The end of the “supercycle” and the subsequent economic and political fallout in Brazilian has perhaps put paid to these ambitions for a while. However, they do provide a template for what can be achieved in a short space of time when political interests combine with economic necessities.

The Brazilian Co-operation Agency, or Agência Brasileira de Cooperação (ABC) is the government agency responsible for international technical co-operation. In general, Brazil’s overseas involvement is designed to be a partnership of “mutual benefit” and “peer learning” rather than the granting of aid from one country to another. ABC’s support is based on knowledge transfer, capacity building, the
use of local labour, project design based on local specification, an absence of conditionality and respect for sovereignty. It operates in 81 countries around the world, of which 36 are in Africa. ABC focuses on skills development, education, public health, agriculture, and social development.

ABC’s agricultural co-operation is in partnership with EMBRAPA (Empresa Brasileira de Pesquisa Agropecuária). EMBRAPA is the Brazilian government’s agricultural research agency, and was one of the chief drivers behind the transformation of Brazil’s Cerrado region from an agricultural backwater in the 1960s to one that accounts for nearly 50% of Brazil’s grain and oilseed production today. Established in 1973, EMBRAPA employed an integrated strategy to raise productivity, with major initiatives including the addition of lime to neutralise soil acidity, the development of high-yielding soybean varieties suitable to the tropics and the implementation of appropriate farming practices.

Brazil’s expertise in the development of tropical agriculture and underperforming agricultural land brings a unique set of skills across other geographies, most notably Africa. At the heart of EMBRAPA’s efforts was the utilisation of technology to improve productivity. A few of the areas of coverage include agro-energy, tropical fruit production, vegetable production and processing, post-harvest technologies and animal husbandry. EMBRAPA works alongside existing development initiatives in Africa and focuses on value-added services, specialist skills and intellectual property rather than land. Some of its partners include the Bill and Melinda Gates Foundation, the Forum for Agricultural Research in Africa (FARA), FAO, DFID, Inter-American Institute for Cooperation on Agriculture, and others.

**Figure 31  EMBRAPA in Africa**

**Hubs and corridors**

We noted previously that the geo-strategic imperative to feed a planet of 10bn souls within the next generation is dependent upon an army of undercapitalised smallholders, structured in such a way that they struggle to attract sophisticated capital. Some 70% of farms in Sub-Saharan Africa are less than two hectares in size, leaving them vulnerable to the vagaries of the weather and that of the market. Recognising this, many African countries have established farming hubs and development blocks to aggregate land and attract private investment in agriculture. A development block or hub, aims to reap the economic benefits from having multiple related businesses in a specific area, while also improving employment opportunities and social outcomes. A few of these major initiatives are outlined in the chart below.
The government’s role in this case is usually limited to the provision of infrastructure and other supplementary services. However, development blocks and hubs are complex to establish, involving multiple stakeholders with different interests and require considerable amounts of capital. They may be the future but, given those challenges, some, such as Nigeria’s Staple Crop Processing Zones (SCPZ), have struggled to get off the ground.

We have highlighted a number of African schemes above but this model has equal validity elsewhere. Take the Sino-Singapore Jilin Food Zone (SSJFZ), which could be categorised as a Chinese version of the African schemes highlighted. The SSJFZ is based in North East China and aims to build a “world-class, integrated and sustainable model food zone tailored for quality and safe food production in China and the region.” Overall the scheme is 1,450 sq km with a core area of 57 sq km. As we see it, this scheme seeks to combine several strategic objectives: China’s twin needs to fulfil its own long-term strategic imperatives of food security and food trust, Singapore’s ambitions to deploy long-term capital from its own sovereign funds and promote its value added services in food-related technologies.

How do all these seemingly disparate endeavours, whether originating in Brazil or Singapore, or being created in Africa or Asia, relate to Brexit? Very simply they demonstrate how a strategic objective once identified can be rolled into a policy and plan capable of meeting developmental, commercial and political goals for different countries and their respective economic agents. It also points to countries using comparative advantage ruthlessly and effectively. That takes us to the last piece of the jigsaw: how the UK can use its capital markets capabilities to ruthless effect.
Capital markets: bringing agriculture and the City together
Decades ago, one of the authors of this report decamped to China for almost a decade. He arrived when China was a mere also-ran in the world economy and left it, nine years later, by which time it was well on its way to becoming the second biggest economy on the planet and a fulcrum of global growth. During that time China used international capital markets – mostly Hong Kong – to create conduits to capital for its burgeoning private sector. How it created those conduits to capital has resonance for the UK, its food and agriculture sector and its extensive capital markets base.

We noted earlier that fundraising for agricultural investments is problematic. Illiquidity, inadequate scale and a lack of professional management all pose problems when it comes to attracting capital. China faced similar challenges with its industrial and commercial apparatus’ huge demands for capital. The emergence of stock markets in Shenzhen and Shanghai allowed China to attract HK$ and US$ for investment respectively from the early 1990s onwards. However, the most revolutionary financing concept was the use of “asset injections” from the mid-1990s onwards, whereby the state-owned assets were aggregated into a single corporate form and listed on, for the most part, the Hong Kong Stock Exchange.

Figure 33  An asset for shares model

![Diagram showing the asset for shares model](Source: Ferguson Cardo)

As the previous chart illustrates the state bundles several cashflow-generating assets into a new company and sells a stake in the new company to external investors. Thus, assets gain liquidity, scale and access to capital markets; and the state gains through a continued shareholding in the holding company. After the initial assets-for-share swap, more assets can be added to the company. The injected assets are often issued at a discount to their intrinsic value. Therefore, the higher the discount, the better the subsequent share price performance. Assets can also be injected into listed dormant/shell companies to hasten the process.
Many of China’s most prominent state-owned enterprises have raised capital in this manner: Beijing Enterprises, Shanghai Industrial, Guangdong Investment and CITIC Pacific all had their origins in this funding mechanism. The relevance of this to the UK should be obvious. Agribusinesses, everywhere, are undercapitalised. Smallholders do not tap capital markets and this is something that has to change just as it has in every industry over time. Thus if the agribusinesses of the future are to prosper they must tap capital markets in exactly the same manner as every other industrial and commercial sector.

We noted at the beginning of this report that the biggest challenge faced by New Zealand’s agriculture sector in 1984 was the need to find new international markets overseas for its products. The same applies today to the UK but that challenge extends beyond food and agriculture and into financial and business services. This sector accounts for over 12% of the UK’s GDP and is an industry upon which a setting sun would be as alarming as the one which set upon a whole range of British industries in the early-1980s.

In conclusion, much as political, social and economic revolutions can be traumatic affairs, they are also capable of delivering enduring benefits. We are perhaps witnessing the end of the post-War consensus, an era founded during the United Kingdom’s most disquieting years and forged in an age of desperate austerity. The mind of the historian might ask how a William Beveridge could publish his eponymous report in the same month that battle commenced at Stalingrad. The same historian might also ask how it was that the great post-War institutions, arrangements and their successors – The World Bank, the International Monetary Fund, the WTO and the Bretton Woods System – were created within weeks of the Normandy Landings. We may no longer live in such straitened times, but a society which ignores warning signs and does not adapt to new realities will – eventually – face existential threats. Dangerous times call for radical thinking.
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