Introduction

It is well known that capitalist development depends on free wage labor and previously accumulated capital, as Marx (1967/1867, p. 166) claimed “the owner of money must meet in the market with the free labourer”. This claim, of course, implicitly assumes sufficient supply relatively affordable food for the proletariat in the capitalist sector, as both industrialization and urbanization greatly increase the demand for food commodities. However, there is no guarantee that the national agriculture (be it capitalist or non-capitalist) can always provide enough food for the expanding industrial capitalism.

For example, as the first major capitalist economy, Britain’s stagnant agricultural production during industrial revolution was a severe constraint on its capitalist development (Allen 1999). According to Patnaik (2003), Britain’s compound growth rate of cereal output between 1700 and 1850 was merely 0.27 percent. For roughly the same historical period, estimates from Clark (1991) suggested that the average growth rate of grain output was about 0.5 percent. This was far from enough to feed the British capitalism. Therefore, Britain transitioned from a moderate food exporter during much of seventeenth and eighteenth century to a major importer since 1800 (Mitchell 1988, p.221).

---

1 Department of Economics, Howard University. Zhun.xu@howard.edu.
When the food problem cannot be properly addressed via global market, capitalism may run into difficulties. The lack of access to affordable food was among the underlying causes of the Russian revolution in 1917, the Chinese revolution in 1949, as well as the recent Arab Spring.

Historically, global capitalism has employed different means to tackle its food problem. For example, as McMichael (2009a) suggested, from 1870 to 1930s tropical and colonial products were imported to the European industrial class and the British “workshop of the world”; while from 1950s to 70s flows of surplus food from the US re-routed to its post-colonial states on strategic parameters of the Cold War. In the literature, the rule-governed structure of production and consumption of food on a world scale is also called food regime (Friedmann 1993). The food regime analysis considers fundamental questions regarding capitalism such as where, how and by whom is (what) food produced and consumed (Bernstein 2016).

In essence, we can understand food regime as a geographical solution to the problem of food in capitalist development. In some cases, domestic ruling classes are not interested in land reform and getting rid of the unproductive landlords. In other cases, agrarian capital is more interested in producing cash crops rather than food. The unwillingness/incapability of growing local food by capital is then compensated by food from elsewhere. This is more than welcome by the big agrarian capital. As the chairman of Cargill puts it: “There is a mistaken belief that the greatest agricultural need in the developing world is to develop the capacity to grow food for local consumption. This is misguided. Countries should produce what they produce best—and trade.”

Under the geographical solution, a natural consequence is the unevenness of food production and trade. Figure 1 presents the volume of net cereal exports from the five continents in 1961 and 2011.

---

Asia and Africa together imported over 150 million metric tons of cereals in 2011, while the Americas and Europe exported approximately the same amount of cereals. Geographically speaking, in the global food trade, cereals flow from the Americas and Europe to Asia and Africa. To put it in another way, cereals tend to flow from more developed part of the world to developing countries. This was not the case half a century ago. In 1961, Europe was the largest cereal importer. Africa and Asia still could largely feed itself by its own produce and were much less involved in the global food regime. This growing dependence and unevenness was a major theme of the past five decades.

This extreme unevenness implies that there is a limit to the geographical solution. On the one hand there is the increasing dependence of vast populations in the developing world on the developed world. On the other hand, there is no guarantee that the exports from the developed world will satisfactorily meet the demand from the developing world. A mismatch between the two easily brings about a major disruption of the international food trade. Therefore, this uneven pattern shape the basic contradiction of the current global food regime; such a contradiction, as we shall see below, has been, and will be, haunting capitalism.

We elaborate this argument based on a historical reading of the evolution of food regimes. By exploring the three major global food crises since the beginning of the food regime, we trace the historical forces behind the crises and the restructuring of different food regimes. In particular, we focus on how the development of the developing countries posed a serious threat to the regime.

The next section discusses the historical changes of the global food regime, highlighting the first two major crises of the food regime and the subsequent restructuring. Then we will investigate the most recent crisis and the limited capacity of the current regime to fully address future challenges.
The fourth section explores the future of food in global capitalism as well as the foundations of an alternative food regime. The fifth section concludes the paper.

The evolution of global food regimes

The system of production, consumption and exchange of food on the world scale has its origin in the development of capitalism, which started in Europe and brought down the great walls of all other non-capitalist countries in the last several centuries. It was under global capitalism that the basic conditions of a food regime were satisfied. First, a global market came into being and food consumption became disentangled with the local or national food production. Second, capitalist development -- that is, urbanization and industrialization on the one hand, and capitalist oriented agrarian change on the other -- created unprecedented level of demand for food commodities.

Intuitively, a well-functioning food regime should be able to maintain a relatively low and stable food price index for a considerable period of time, which is often the prerequisite of urbanization and industrialization. On the other hand, irregular price hikes and fluctuations often signal a period of crisis and a restructuring of the food regime.

Figure 2 presents changes in the global real food price between 1800 and 2016. Due to lack of long-term data on the real price of food, we use three distinct data sources for this figure. Between 1800 and 1913, we use Rousseaux price index of the vegetable products (mostly cereals) based on Mitchell (1988, p. 722-4), deflated by Rousseaux price index of principal industrial products. This index is solely about Britain, which was the most important food importer of the time. We obtain the price index of international traded food commodities (GYPIF) between 1900 and 1986 from
Grili and Yang (1988). The series is deflated by price index of manufacturing goods (MUV) also from Grili and Yang (1988). The most recent data series between 1961 and 2016 is the deflated FAO food price index. The three series are not directly comparable due to different coverage and weights of food items.

Examination of Figure 2 allows us to roughly divide the last 200 years into three major periods of food price tranquility. The first one started from the mid-19th century and ended with WW1; the second one started from 1920s and ended in the early 1970s; the third one started in the 1980s and ended with the recent major global food crisis (which has been in effect until now). In each of these relatively stable periods, a distinct set of historically contingent rules was formed to direct production and trade on the global food market. While, to be sure, there is continuity between these successive periods, each period nonetheless features a unique, distinct, food regime. Each period features a unique food regime, although there is also clear continuity between these successive regimes.

The creation of the first global food regime resulted from the repeal of the British Corn Laws in 1846. Britain, the driver of the first food regime, was looking for cheap food imports from all over the world to feed its growing industrial population (Winders 2009). Britain’s reliance on foreign food imports had been increasing throughout the late 1800s. During most of the time in the first half of the 19th century, less than 10 percent of the British population relied on foreign wheat; this ratio kept increasing after the 1850s, reaching close to 80 percent before WW1 (Ejrnæs et al 2008).

Under the first food regime, Britain was the sole major food importer, while the eastern European countries and the new world were major exporters. Over time, the exports from Americas and other colonies gradually replaced the role of eastern European countries. In the 1860s, for example, close to half of Britain’s total wheat imports came from Germany and Russia, and the Americas (mostly
United States) contributed about another 30 percent. During the following half century, Germany gradually stepped out of the British market. Between 1901 and 1914, the only substantial exporter on the European continent was Russia, supplying about 15 percent of Britain’s wheat imports, while about another 60 percent came from Americas (United States, Canada and Argentina).

The Britain-centered food regime worked fairly well until WW1, when the prevailing food trade system was inevitably disrupted. Besides the severe damage to Britain’s own agricultural production, the traditional food exports from Russia became unavailable first due to the war on the continent, and then because of the Russian Revolution and the subsequent civil war. The market crisis at least partly came from the sudden withdrawal of this once “breadbasket of Europe” from the global market.

The country that came to replace Russia’s role was the United States. During the war time from 1914 to 1918, USA exported 11 million tons of wheat to Britain, which was half of British wheat import (based on Mitchell 1988, p. 231). During the reconstruction period from 1919 to 1926, the US shipped a total of 6.23 million tons of food to Europe (Shaw 2007, pp. 12). From the very beginning, the purpose of aid from the US was to stabilize Europe. Herbet Hoover, the newly appointed head of US Food Administration, claimed that the aims of the US were to fight both starvation and anarchy (communism) in Europe (Patenaude 2007).

The US was able to solve the crisis of the first regime by regulating food production (special credits for agriculture) and sending food aid to its allies (Shaw 2007, pp. 12). The US government mobilized the US people to join food ration campaigns such as “meatless Mondays, wheatless

---

4 Ibid.
Soon the US started accumulating more than enough food, and Hoover even sent food aid to the Soviet Russia, as he admitted in 1921: “The food supplies that we wish to take to Russia are all in surplus in the United States, and are without a market in any quarter of the globe” (Patenaude 2007).

Thus the new US-centered food regime was already in its initial form in the interwar period, but it was soon interrupted by the Great Depression and WW2. The overproduction in the US became a serious problem when the traditional food importers in Europe went through hardships after 1920s. The Great Depression led to self-sufficiency and protectionist trade policies, and Britain for the first time since the repeal of the Corn Laws imposed tariffs outside of wartime (Friedmann 1982). The collapsing market prices pushed the US to continue its price-support policies with further institutional arrangements such as the Agricultural Adjustment Act and the Commodity Credit Corporation (Winders 2009).

After WW2, there emerged a fully-fledged US global food regime with newly independent states joining the global food market. Figure 2 suggests that from the early 1950s, this regime successfully maintained about 20 years of either decreasing or stable food prices with only a few fluctuations.

From the very beginning, this regime sought to achieve two different objectives: exporting surplus food (in the US) to the global market and strengthening the capitalist bloc. The Marshall plan helped rebuild agriculture in the nonsocialist European states, which stabilized these countries but increased the problems of surplus disposal (Friedmann 1982, 1993). Meanwhile, under Public Law 480, the US food aid provided timely cheap food for the newly independent states, effectively

---

5 See some interesting background notes and sample recipes during this period from Cornell University Mann library online exhibits, http://exhibits.mannlib.cornell.edu/meatlesswheatless.
transforming the previously self-sufficient third world countries into new consumers dependent on imported food (Friedmann 1982, 1993).

However, the very mechanism that constructed the second food regime also contained the seeds of the regime’s destruction. In the developing world, the regime discouraged self-sufficiency in food production, while industrialization and urbanization created ever-increasing food demand. The exports from the US and other countries, however, were barely able to accommodate the new demands. As Table 1 suggests, between 1960s and 1970s, the net cereal import in East Asia doubled and that in Africa tripled. Meanwhile, the net exports from Americas only increased by about than 85 percent.

Although the US food export was able to satisfy the demands from the developing world (see Table 1), the socialist bloc, in particular the USSR, was largely outside of the food regime. In fact, the USSR had long been a net food exporter like the Russian empire in the 19th century. As Table 1 suggests, in the 1960s, the net cereal exports from the USSR was about the size of total net cereal import of the whole Africa.

However, when the USSR decided to improve the standard of living of its citizens from the late 1960s (in other words, adopting a Westernized meat-based diet), the picture decidedly changed (Cook 1993, pp. 62). In the 1970s, the USSR became a major food importer on the global market, with rapidly increasing consumption of livestock products (and indirectly feed grains) (Central Intelligence Agency (CIA) 1984).

The welfare state building in the USSR posed a long-term threat to the global food regime. In 1990, most of the Soviet citizens consumed equal or more meat than their counterparts in the UK although the latter were much wealthier (Sedik 1993). The calorie intake in the USSR also matched
the US (CIA 1984). As a result, the growth of cereal imports in the USSR clearly dwarfed Africa and East Asia, more than doubling between 1970s and 1980s.

Initially this unexpected shock in global food trade put much pressure on the existing food regime. This led to the crisis of the early 1970s when global food prices soared just like the WW1 days. By the mid-1970s, global food prices stabilized, and remained stable until the 2000s. The crisis was not solved by a change in the mechanism like the aftermath of WW1. Rather, it was solved by evolutions and adjustments in the regime itself.

The first adjustment was from the headquarters of the food regime, as the US significantly increased its food supply to the world market, while, more importantly the long-term food deficit region Western Europe became self-sufficient and even started exporting food. History thus reversed itself. Partly thanks to the help from the US, Western Europe was able to rebuild its agriculture after WW2 and gradually got rid of its historical food dependency. According to Table 1, a large part of the shock from increasing import demand in the USSR was offset by the new supply from the Western European countries. The second adjustment came from the USSR itself. The demise of the USSR in early 1990s and the great impoverishment afterwards immediately decreased a significant part of the food demand from the former Soviet citizens. The unmaking of the Soviet welfare state actually made the whole region export food again. For example, in the 1990s, Russia dramatically reduced its demand for imported food and started exporting large amount of cereals in 2000s despite little increase in production (see Table 1).6 Both changes contributed to the relatively stable condition of the global food market.

6 According to FAO statistics (http://faostat3.fao.org/), Russian cereal production stagnated around 80 million metric tons since the early 1990s, only had some moderate increase in the last few years.
The crisis of the second food regime and its subsequent reconstruction seems to illustrate its core contradiction. The US was able to solve its own food surplus problem by selling cheap food to the developing countries and making them dependent on further food imports. This placed ever increasing pressure on the global food market. This regime works fine only if the demand from the developing world happens to be equal or lower than the surplus grains produced in the core countries. It was only a matter of time to reach the point where a few core countries in the regime found themselves unable to produce enough surplus for the whole world. Once countries such as the USSR tried to imitate the life style of the US and significantly boosted its food consumption, the regime experienced severe disruptions. In essence, the way in which world capitalism stepped out of the first food regime and supported the second regime, eventually turned against itself.

The third food regime, and the next one?

The adjustments by the Western Europe as well as the former USSR following the 1970s crisis gradually paved the way to the third food regime. It is worth mentioning that the impact of the US is clearly in decline, as its cereal net exports gradually decreased in recent years. As Figure 3 suggests, during the 1970s crisis, the US alone accounted for about 50 percent of the total global export of cereals. At the beginning of the current century, the US still provided about 30 percent of the global cereal exports. However, the ratio kept decreasing, until it reached to about 20 percent during the most recent crisis. In particular, US share of global wheat export has declined to about only 13 percent in the 2015/2016 trade year; this is unprecedented since the establishment of the second food regime (calculated based on USDA 2016).
The third food regime shared the same weakness with the second regime, that is, the lack of capacity to absorb new demand from the world. Keep in mind that the crisis of the second regime was never really solved. Rather, it was postponed (by the demise of the USSR among other things). However, the demand from third world continued to increase partly as a result of a transition to meat-based diets. In the 2000s, as Table 1 suggests, the net import of cereals in Africa and East Asia alone was already about the same size of the net export from North America. At the same time, the food exporting countries were decreasing their supplies --- both North America and Western Europe exported considerably less cereal in the new century. One important reason for this decrease was that a significant portion of agricultural land was devoted to biofuel productions (Magdoff 2008, Headey and Fan 2010). These two trends (i.e. the increase in third world demand and the decrease in American and European exports), coupled with bad weather, financial speculation, as well as declining stocks in major cereal importing countries, prepared the ground for the most recent food crisis starting from the late 2000s (Magdoff 2008, Headey and Fan 2010).

Therefore, the recent food crisis was a continuation of the crisis of the 1970s. Unlike the relatively fast price restoration during the 1970s crisis, the 2000s crisis saw high prices for years, which in itself points to the regime’s lack of capacity. Very recently, however, prices have been restored to lower levels. Two factors have contributed to this return to low food prices. First of all, the biofuel production (which, as noted above, was a partial cause of cereal export decline) grew much slower in the United States and Brazil among other countries. For example, biofuel production in the US grew at 24 percent per year between 2004 and 2011, but its growth rate decreased to about 2 percent per year between 2011 and 2015.7 Second, the European Union (mainly the Western

---

European countries) and former USSR countries greatly increased their production and exports, adding to the world supply of cereals. For example, Russia and Ukraine more than doubled their wheat exports since the crisis broke out (calculated based on US Department of Agriculture (USDA) 2012, 2016). In the coming years, the former USSR countries such as Russia and Ukraine are projected to play a much larger role, with Russia alone exporting similar quantity of wheat compared to the US by 2021 (Liefert et al 2013).

It is still too soon to discuss the full features of the coming food regime following the crisis. But the decline of the US as the center of the food regime, and the rise of former USSR countries in food trade, suggest that the current fix to the food regime rests on very shaky ground. The lack of a center such as the US will make it ever more difficult to address the global food problem given that the unevenness of food production and dependency still prevail. Moreover, Russia’s transition to a major cereal export country is primarily based on depressed domestic consumption following the demise of the USSR (Liefert et al 2013). But sooner or later, the Russian population will once again demand more livestock consumption, which will greatly reduce the amount of cereals for export.

Beside these, there are other long-term factors that will cause significant trouble for the next food regime. On the demand side, China, among other developing countries, will likely keep increasing its food import. China for a long time was outside of the global food regime, as it was mostly self-sufficient. And China was largely unaffected by the food crisis in the 2000s (McMichael 2009b). But in the last few years the situation has changed dramatically. China’s cereal imports more than doubled since 2009, not to mention that it already imported more than 60 percent of the world
soybean exports in 2012. Another alarming fact is that several major developing countries, including China, India and Mexico, have reported declining calorie intake in the neoliberal era (Xu and Zhang 2015, Basu and Basole 2013, Valero-Gila and Valerob 2013). If these countries, together with more westernized diets, start improving their nutritional intake, it will undoubtedly generate a huge amount of food demand on the global market.

On the supply side, there is limited scope for further increasing food exports from the traditional exporting countries. As Table 1 shows, the North American net cereal exports have gradually been declining for the last three decades. As one of the largest producers and consumers, China’s grain production might have already stagnated since the late 1990s (Xu et al 2014). There is of course tremendous potential in the developing countries, but it cannot be realized without substantial investment, organizing, and the momentum to end their food dependency. At the same time, the US type fossil-based energy intensive modern agriculture is simply not sustainable in the long run (Pimentel 2009). Serious soil degradation and increasingly costly irrigation, among other environmental issues, create firm ecological limits to future expansions of the food supply (Kindall and Pimentel 1994).

Therefore, post-crisis global capitalism has failed to solve the ongoing problem of sustainably meeting world food demand. Just as in the 1970s, capitalism has merely postponed the crisis, -- although more sluggishly this time. With the lack of leadership in the core capitalist countries, the unstable supply from former Soviet countries, the new participation of China, and the continuously increasing demand from the third world, the new crisis is already on the horizon.

---

The future of food in global capitalism

The global food regime emerged as a geographical solution to the problem of food in capitalist development. The British regime was a special case, because Britain was the first and largest capitalist economy at the time. Britain was probably the only place that had an endogenous need for a significant amount of food imports, compared to the self-sufficient traditional societies. It was the second regime, led by the US, saw the expansion of capitalism all over the world, especially in the third world. The lack of cheap food in the developing countries constituted a severe limit on industrialization and urbanization, and global capitalism’s solution was the surplus grain from the US and a few other countries. So the rapid expansion of capitalism abolished any possible Corn Laws of the third world, and deprived it of the capacity to feed themselves. For the half century after WW2, global capitalist development was supported by food exports from a few core countries in the regime. However, as we have seen, first with the 1970s crisis, then with the 2000s crisis, the geographical solution to the food problem has clear limitations even in terms of capitalist development. If the trend in Table 1 continues, it is unlikely that a few core countries will be able to meet the food needs of capitalist development in the world.

Technically we have long been able to feed the world population with sufficient nutrition, but the food regimes under capitalism have failed to do the job. The problem of food dependency and the regime’s lack of capacity to accommodate global demand continues to haunt the global food regime and capitalism in general. The many adjustments since the 1970s have essentially tried to get around the problem, but without success.
The food dependency was a result of consent of the ruling classes in the third world and the big global capital in the core countries during the cold war (Friedmann 1982, 1993, Bernstein 2016). On the one hand, the US found places to dump its surplus grain; on the other hand, the developing countries were able to escape from the duty to implement much needed land reform to build its agriculture. Food dependency was further reinforced both by the coercive structural adjustment packages from the World Bank and IMF and the whole neoliberal ideology.

As we have seen from the repeated food crises, a basic human need such as food is too important to be put in the hands of unreliable free market and global capital. The way to better feed the world population, especially in the third world, is to develop an alternative food regime. First of all, the food production in the alternative regime has to be both locally oriented and environmentally sustainable. Each country, provided it has the necessary natural endowments, could develop its own food production. This transition would entail agrarian reforms supporting smaller producers and cooperatives and rebuilding national agriculture. It also must include efforts to use cover crops, crop rotation, as well as manure to gradually reduce the dependence on fossil fuels (Pimentel 2009). In this sense it is applying a sustainable version of the Western European experience under the second food regime to the third world in general.

Second, and equally importantly, food consumption in the alternative regime needs to be regulated by sustainability standards. The meat-based diet that prevails in the US among the developed world requires more energy, land and water resources than plant-based diet and is not sustainable in the long run (Pimentel and Pimentel 2003). The history of the last fifty years repeatedly tell us that as the developing countries try to imitate the consumption styles of the US, the global food supply becomes insufficient to meet all the demand. It is important to criticize the role of food dependency in the food crisis, but it is also important to recognize the harm of a universal meat-based diet. This
transition requires cooperation among the national governments as well as strict regulation on the major agrarian capital in its use of grains.

The main challenges to such a transition is not from the technology side (we are not in a Malthusian world after all). Rather, it is from the established interests of big global capital from the core countries, insofar as they have profited from the food business. It is also from the established interests of the third world ruling classes that benefit from the geographical solution to the food problem.

It remains to be seen whether global capitalism could absorb this transition as a different solution to the food problem. Continuing the old geographical solution (food dependency of the third world) is increasingly costly and prone to crises, but making the transition is obviously against the interests of at least part of the capitalist class.

Conclusion

As a vital part of global capitalism, the food regime has been facilitating capitalist development over the world as a geographical solution to the food problem. Since its beginning in the 19th century, the global food regime has gone through significant transformations over the last one hundred and fifty years. This paper explores the three major crises of the regime and the dynamics of the restructuring. We argue that the way global capitalism solved the crisis of the first regime paved the way to the second regime, and the contradictions of the later regimes also precipitated the crises in the 1970s, 2000s and beyond. In essence, the post-war food regimes were based on the strict conditions of surplus food in the core developed countries and food dependency in the third world. We have demonstrated that the regime is inherently unstable. Declining capacity of
food supply in the core countries, plus the increasing food demand from the food dependent third world, constitute the primary contradiction in the regime since the 1970s.

Despite its continuous adjustments, the global food regime has been a very inefficient system to feed everyone. In 2015, we still have 795 million people in the world in hunger, and 780 of them are in the developing world.⁹ At the same time, as we have argued, this regime is both vulnerable and unsustainable. An alternative food regime is both necessary and possible. A departure from the current food regime will need to include two main changes: first, global food production has to be both locally oriented and sustainable; second, the global consumption has to be based on plant-based instead of meat-based diets. The task of ending the old food regimes and making the transition to a more humane and sustainable one will require efforts from both the popular movements and academic researchers. The future of food ultimately is in our own hands.

References


Table 1 Average annual cereal net export per decade in selected regions/countries

<table>
<thead>
<tr>
<th>Decade</th>
<th>North America</th>
<th>Western Europe</th>
<th>East Asia</th>
<th>Africa</th>
<th>USSR</th>
<th>Russia</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960s</td>
<td>51138</td>
<td>-7521</td>
<td>-16780</td>
<td>-3182</td>
<td>2438</td>
<td></td>
</tr>
<tr>
<td>1970s</td>
<td>94695</td>
<td>-1509</td>
<td>-32987</td>
<td>-10445</td>
<td>-13550</td>
<td></td>
</tr>
<tr>
<td>1980s</td>
<td>116912</td>
<td>16446</td>
<td>-49774</td>
<td>-24541</td>
<td>-35161</td>
<td></td>
</tr>
<tr>
<td>1990s</td>
<td>105841</td>
<td>30138</td>
<td>-49220</td>
<td>-33747</td>
<td>-8154</td>
<td></td>
</tr>
<tr>
<td>2000s</td>
<td>99985</td>
<td>23339</td>
<td>-41953</td>
<td>-49672</td>
<td>9895</td>
<td></td>
</tr>
</tbody>
</table>

Notes: All the exports are in 1000 tonnes. Net export is export minus import.
Notes: All exports are in 1000 tonnes. Net export is export minus import.
Notes and sources: The 1800-1913 series is the Rousseaux price index of vegetable products (mostly cereals) based on Mitchell (1988, p. 722-4), deflated by the Rousseaux price index of principal industrial products. The Rousseaux indices set the average value of 1865 and 1885 as 100. In a similar fashion, the 1900-1986 data are based on the unit of value of exports of manufactures of a number of industrial countries (MUV), as well as food price (GYCPIF), both of which are from Grilli and Yang (1988). The 1900-1986 series uses 1977-79 as the base years. The 1961-2016 real price index data are from the FAO food price index (2002-2004 as base years), http://www.fao.org/worldfoodsituation/foodpricesindex.
Figure 3 The US share of global cereal export 1961-2011