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Chapter 8 Impact of the Resource Boom in the 2000s on Asian-Pacific Energy Exporting Countries

Abstract:

Resource booms generate the Dutch disease and increases vulnerability to resource price shock in resource-dependent countries. This chapter analyzes whether both the global resource boom in 2003-08 and China-induced boom in 2009-13 caused these effects in the Asian-Pacific region. It considers the three coal and gas exporters of Australia, Indonesia and Kazakhstan, the two natural gas exporters of Myanmar and Turkmenistan, and the coal exporter of Mongolia, employing a trade specialization coefficient (TSC) and a relative comparative analysis (RCA) to analyze the impact on export competitiveness by industries. Results reveal that all the six countries suffer from the real appreciation and the Dutch disease, face stronger export specification in resource extraction sectors and low value-added primary and industrial sectors, and exhibit an increasing trade dependency on China ---all of which make them more vulnerable to resource price shocks. The extent, however, depends on the type of fuel for export, resource dependency in its export, its initial industrial structure, international competitiveness, macroeconomic management, and resource governance. China has acquired assets, resources and infrastructure in exchange for reducing its trade deficit, providing little, if any, effective counter measures to allow them to escape from the Dutch disease.

1. Introduction

China is aggressively searching for resources to sustain its high-speed economic growth. While it contradicts the traditional view of energy security that is defined as ensuring a sufficient energy supply at an affordable price with little risk, it changed the interpretation of the view: the additional development of oil and gas around the world enhances the energy security of China through increasing global energy security (Hayashi 2006).

This interpretation justifies a huge amount of fuel imports. China has rapidly increased its oil imports since 2003 when it suffered from frequent blackouts. It diversified its suppliers from the traditional Middle Eastern oil producers of Saudi Arabia, Oman, Russia, and Iraq, which came back to the oil market after the recovery, to the African and Asian autocratic countries of Angola, Venezuela, Kazakhstan, Iran, and Sudan, on which Western countries had imposed trade sanctions (Figure 8-1). It also increased imports of natural gas, not only from the traditional liquidated natural gas (LNG) exporters of Australia, Qatar, Malaysia[1], and Indonesia, but also from the autocratic countries of Turkmenistan, Myanmar, and Uzbekistan by developing gas pipelines (Figure 8-2).

It was not until 2009, after the global financial crisis, that China began massive coal imports.

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[1] At the time of the contract.

The 4 trillion Chinese yuan fiscal stimulus, in line with the financial relaxation policy, stimulated local governments and state enterprises to invest in infrastructure and urban development to boost the demand for iron, steel, cement, and coal. However, a shortage of transport infrastructure and a domestic coal price hike (Horii 2014) restricted a stable domestic supply, driving them to seek imports from a variety of countries including Australia, Indonesia, Russia, Mongolia, and North Korea (Figure 8-3).

China's massive fuel imports gave an additional boost to the rise in global prices of most energy and metals commodities and for some agricultural commodities in real terms. These rose to their highest levels ever in the eight years after 2003 when the resource boom began. It continued, with only a brief interruption during the global financial crisis in 2008, until 2014, when Chinese economic development began to show the influence of a new model of economic growth (Garnaut, Fang, and Song 2013).

Some research has explored the impact of the China-induced resources boom in the early 2000s on its trade partners. While it enabled most of the resource exporting countries to enjoy high terms of trade and strong growth in investments in expanding exports of resource-intensive goods and spent much of this increased income as it arrived, it caused export- and import-competing industries beyond resources to experience slower growth or to decline (Garnaut 2015). It reduced growth in the labor-intensive manufacturing sector in Indonesia and Vietnam during 2001-4 due to their less diversified industrial structure (Coxhead 2007). It left Indonesia and Australia with domestic political cultures and institutions that are poorly structured to achieve productivity-raising reforms (Garnaut 2015). Others focus on the impacts in later periods, but from a different resource and viewpoint. Massive exports of palm oil to China and India reduced jobs in skill-intensive industries and increased low skill intensity industries, causing the Dutch disease effect (Coxhead and Shrestha 2016). Chinese pipeline projects may not only pose social and environmental risks but also bring about few economic benefits and employment to Myanmar (Zhao 2011). On the other hand, the China-led oil-for-infrastructure scheme can be viewed as providing several African countries with precious capital to develop infrastructure that has been a bottleneck of economic growth, thus capital that can mitigate the resource curse (Brautigam, 2009).

Among these effects, this chapter focuses on the Dutch disease to explore whether the global resource boom and the China-induced boom generated it and increased vulnerability to resource price shock in the six Asian-Pacific energy-exporting countries, and what they have addressed to mitigate it. It takes six Asian-Pacific energy-exporting countries with different characteristics as cases. It employs several macroeconomic data to examine whether they went through the pathway toward the Dutch disease, and employs several indexes to analyze the change in the vulnerability.

The remainder of the chapter is organized as follows. Section 2 makes a literature survey on the

2

Dutch disease to draw out an analytical framework, which is elaborated in Section 3. Section 4 analyzes the macroeconomic impact and section 5 the change in the vulnerability. Section 6 discusses factors behind the changes and different impacts in these countries, and section 7 concludes.

2. The recent resource booms and the Dutch disease

The recent resource booms can cause a resource curse that is prevalent in many resource-exporting countries. An increase in natural resource exports makes a country less competitive in non-booming tradable sectors, especially labor-intensive manufacturing exports that bring the increasing return to scale due to the delay in learning spillovers. This can frustrate growth via the Dutch disease phenomenon (Sachs and Warner 1997). This is induced by two factors. The one is a shift of labor to booming sector from non-booming tradable sectors (the resource moving effect), which can crowd-out entrepreneurial activity or innovation (Sachs and Warner 2001). The other is a higher level of spending for consumption of non-tradable goods (the spending effect), which brings further appreciation of real exchange rate (van Wijinbergen 1994). Domestic investment and output rises and adds to the spending effect. This brings about larger real appreciation and current account deficit, and eventually accumulates external debt, which will eventually be paid back.

As long as boom is permanent, high terms of trade are going to make future of countries better off as they match with the high productivity. Future generation can feel comfortable about redistributing income away from future to current generation to expand their spending.

If it is temporary, however, an increase in consumption by the spending effect brings about the current account deficit, which depreciates the currency and cools down domestic spending boom when the boom recedes (Corden 1984). This will eventually experience a spending cut that brings about a fall in living standards, a growth collapse, and an abrupt political change (Auty 2006).

The Dutch disease is likely to negatively affect institutions that are determinants of economic growth. Countries whose major exports are point source resources and coffee and cocoa are likely to be hit harder, as these resources are far more susceptible to the government capture (Isham et al 2005). Higher concentration of export goods makes the economy more vulnerable to external shock, exerting a robust negative influence on private investment conditional upon the positive impact of fossil fuel on investment (Bond and Malik 2009). Volatility in price and exports can have swamp direct positive effect of resources on growth, while well-developed financial sectors can mitigate the impact of volatility (van der Ploeg and Poelhekke 2009). It also perpetuates surplus rural labor and amplifies income inequality and social tension, which changes the survival function of political elites and discourages them to manage the rent properly or use it efficiently for wealth creation

(Caselli and Cunningham 2009). They do not always allow other sectors to grow for fear of its increase in likelihood of challenge by outsiders. The unresponsiveness accelerates the concentration to single or a few export goods.

An effective stabilization policy has two elements. One is to minimize the temporary contraction of non-resource industries that will have to be reversed after the boom. A large increase in exports from non-resource tradable industries, such as manufacturing, services and agriculture has to be preceded by large increase in investment in these sectors. If learning spillovers are generated in non-tradable sector and between tradable and non-tradable sector, a resource boom can shifts steady-state relative productivity in favor of the non-tradable sector, and this results in real exchange rate depreciation (Torik 2001).

The other is to avoid real expenditure and income rising so high in the boom that they later have to be reduced (Garnut 2015). This requires substantially large budget surpluses, which should be derived from effective mineral rent taxation regimes. Extra savings generated from resource exports can be sterilized through investments in foreign financial assets in the boom and in domestic wealth creation or productivity-raising activities after the boom (Bresser-Pereira 2013). A "park fund" can be an effective institutional tool to reduce the spending effect by setting aside part of the resource revenue in offshore.

While the floating exchange rate system serves to mitigate real expenditure and income rising, it does not completely prevent real rising. A large real depreciation is required for a country that fails to avoid the real appreciation in the boom. As real appreciation can occur through a rise in the nominal appreciation and/or higher inflation than in other countries, both nominal appreciation and inflation curbing measures are required. Nominal depreciation can be facilitated by a combination of tight fiscal policy and financial relaxation policy, which enables lower interest rate without increasing inflation in a certain environment. A flexible economic structure with a flexible labor market, labor skills (Venables 2016), confronting measures against monopoly and protection can prevent the passing through of the rising import costs (Garnant 2013).

These theoretical arguments suggest that the Dutch disease should be analyzed first in view of the macroeconomic impact, especially an effect on real appreciation, and then of the impact on export goods, especially on the productivity non-resource tradable industries.

3. Methodology

We follow the theoretical framework presented in Corden (1984) to analyze how the economy in the Asian-Pacific energy and resource exporting countries is "infected" with the Dutch disease. In the analysis, we employ macroeconomic indicators employed in Garnaut (2015).

We analyze the impact on vulnerability to external resource price shock by employing the

UNCTAD's export concentration index. It is defined as:

$$\text{EXCON} = \frac{\sqrt{\sum_{j-1}^{N}(Ej/E)2} - \sqrt{1/N}}{1 - \sqrt{1/N}}$$

where exports are disaggregated into N products (97 two-digit HS product categories in the UNCTAD measure) indexed by j, E is the total value of exports, and Ej is the value of exports of product j. This index has been normalized to lie from 0 to 1, so that higher values indicate greater concentration of exports in a narrow range of products (Bond and Malik 2009).

To explore the impact of China-induced resource boom on the index, we employ a trade specialization coefficient (METI 2013). TSC measures the trade specification of a good in a country against a trade partner. For country j, good k, and time period t, the TSC is defined as:

$$\text{TSC}_{jkt}=(X^{j}_{kt}-M^{j}_{kt})/(X^{j}_{kt}+M^{j}_{kt})$$

where X and M denote export and import of good k from country j to a trade partner, respectively. By this definition, $\text{TSC}_{jkt} >0$ means that the export of product k from country j in year t is greater than that from a trade partner, and thus country j relatively specializes in the production of good k against the trade partner. For a given industry, relative export competiveness becomes stronger as TSC_{jkt} approaches 1 and weaker as it approaches -1. The TSC can analyze the change in the relative industrial competiveness against China.

However, the TSC has a limitation in illustrating the competitiveness of the domestic industry in the market other than the specific trade partner. To measure the competitiveness in the world market, we prepare the revealed comparative advantage (RCA; Balassa 1965). RCA measures the intensity of a country's exports of a good relative to the intensity of world exports of that good. For country j, good k, and time period t, the RCA is defined as:

$$\text{RCA}_{jkt}=(X^{j}_{kt}/X^{j}_{Kt})/(X^{W}_{kt}/X^{W}_{Kt})$$

where K denotes the sum of all exports from country j or the world (W), respectively. By this definition, $\text{RCA}_{jkt} >1$ means that the share of product k in the exports of country j in year t is greater than its share in total world exports in the same year, and thus country j has a comparative advantage in the production of good k. RCA_{jkt} values less than 1 imply a comparative disadvantage (Coxhead 2007).

We choose six Asian-Pacific energy and resource-exporting countries to China. Australia and

Indonesia are chosen as countries with relatively developed manufacturing thus diversified economic structure, as well as being exporters of both LNG and coal. They also adopt the floating exchange rate system with inflation-targeting framework. Kazakhstan and Turkmenistan are chosen as countries that were previously a part of the Soviet Union and that export a large amount of oil and gas through pipelines, whose sunk costs makes it difficult to diversify their export destinations. Despite the difference in the detailed arrangement, both employs US dollar as exchange rate anchor[2]. Finally, Myanmar and Mongolia are chosen as countries with a large economic dependence on China for historical and geographical reasons. While Mongolia takes the floating exchange rate system but with multiple exchange rates and Myanmar dual exchange system, central banks in both countries intervene in the foreign currency market to maintain a steady exchange rate.

The trade data used in this chapter are drawn from the IMF's Direction of Trade Statistics and United Nations ComTrade Database, which lists annual imports and exports at the two-digit, four-digit, and six-digit Harmonized System (HS) levels. The macroeconomic data are drawn from the World Bank's World Development Indicators Data Bank and complemented by ADB's Key Indictors. These data are taken from 2000 to the present to highlight the changes before and after the boom. Data availability restricts thorough analysis in Myanmar and Turkmenistan.

4. Macroeconomic impact of the resource boom

The resource boom influenced all the six countries first through the increase in export value. Export value becomes three to ten times higher in 2011-14 than in 2000, with the interruption in the global financial crisis in 2008-9. The increase in export value varies by countries. Indonesia and Australia confined the rise to three to four times, while Mongolia, Myanmar, Kazakhstan and Turkmenistan enjoy the hike by six to eleven times (Figure 8-4). The difference in the rise among Indonesia, Australia and Mongolia can be explained by resource exports: While these three countries are major coal exporters to China, Australia and Mongolia also export ores and precious metals, which amount to much larger than coal exports.

The rise in export value prompted development in the resource sector, which helped expansion of consumption and generated the spending effect. The content of spending varied by country: while Australia and Mongolia steadily enjoyed higher growth in final consumption than that of GDP in the boom, Kazakhstan and Indonesia saw a relatively higher growth in the gross fixed capital formation (Figure 8-5a, 5b, 5c and 5d).

The expansion and composition of spending were largely affected by rent revenue and foreign investment. Turkmenistan, Kazakhstan and Mongolia obtained a significant amount of resource

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[2] Kazakhstan adopts stabilized arrangement and Turkmenistan takes the peg.

rent during the boom (Figure 8-6), which prompt the government to expand final consumption. They also obtained a large inflow of foreign direct investment (Figure 8-7), most of which are directed for oil and gas deployment and pipeline development.

In contrast, Australia, Indonesia and Myanmar have obtained a relatively lower amount of resource rent—around 10 percent of GDP. Nonetheless, the governments in these countries also spend higher revenue as it arrives, bringing about a fiscal deficit (Figure 8-8). In addition, they have rarely invested in foreign financial assets much more than its inflow as a way of sterilizing the spending expansion (Figure 8-9). Most of the increased income accrued to private sector, including foreign companies, which spent most of it in consumption and investment.

The expansion of spending has spurred a large appreciation of the real exchange rate in all the six countries regardless of the composition (Figure 8-10). This occurred despite the floating exchange rate system in Australia and Indonesia, and the significant reductions in the external debt stock in Turkmenistan and Indonesia (Figure 8-11). Except of Turkmenistan, the real rate was even higher for most of the years than in China that has increased the productivity and competitiveness in manufactured goods[3].

The real appreciation discouraged investment and production in tradable goods and services in agricultural and industrial sectors. Their shares in exports fell markedly until 2011 (Figure 8-12), which increased the current deficit (Figure 8-13). External debt stock reaps up in Australia that uninhibitedly encouraged expansion, and in Mongolia that increased foreign borrowing first to finance investment, then consumption (Figure 8-11).

In response, Mongolia, and Australia to a less extent increase the export volume in 2012 (Figure 8-14) in order to compensate the decrease in export earnings. In contrast, export volume does not seem to have close relation with the export value in Kazakhstan and Turkmenistan by 2013. This accrues to the switch in their major export destination from Russia to China (Figure 8-15), which enables them to earn oil and gas revenue in long-term supply contract regardless of the fluctuation of the market price. However, China's economic downturn significantly reduced trade surplus in 2015 in both countries (Figure 8-16).

These macroeconomic indicators provide evidences to diagnose that Australia, Indonesia, Kazakhstan and Mongolia are infected by the Dutch disease. The seriousness is, however, quite different. Mongolia is severely infected in a short period of time while Indonesia is relatively less

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[3] Turkmenistan also suffered from real appreciation after its independence as it increased oil and gas imports to former Soviet Union countries. Russia's resurge as a major oil and gas exporting country has deprived Turkmenistan of international competitiveness as Turkmenistan's exports relied completely on pipelines that transported oil and gas to Russia. This brought about significant real depreciation in the mid-2000s. The rate recovered when Turkmenistan started gas exports to China, and goes well beyond the level of 2003.

affected. Australia and Kazakhstan enjoyed the higher resource prices for so long a time—almost a decade—that they took the boom as permanent, not temporal. This accelerated a real appreciation in both countries, among which Kazakhstan was more severely affected.

5. Export competitiveness and concentration

5.1. Trade dependence to China

The China-induced energy boom has increased export dependence on China of all the six countries. In Mongolia and Turkmenistan, China accounts for more than 90 percent and 70 percent of their export destination, respectively (Figure 8-15). In Australia and Myanmar, the dependence increased by 20 percent during the boom.

Higher export dependence on China has increased the volatility of their economy and economic growth. Turkmenistan and Mongolia regained high economic growth during 2010-13 due to a steady growth of natural gas and coal exports to China (Figure 8-5a~5d). In contrast, Mongolia has severely been hit by China's downturn in economic growth and restriction on coal imports, suffering from a declining growth rate. Kazakhstan's growth rate has become highly affected by the oil price and China's demand.

5.2 Export specification

All of the six countries saw the rise in the export concentration during the global resource boom and China-induced boom (Table 8-1). In Kazakhstan and Turkmenistan, the share of mineral fuels jumped up in the 1998 Russian financial crisis and further increased in the resource boom in the 2000s, crowding out other exports. While Turkmenistan declined the concentration in 2008-9 when it suffered from Russia's gas impart ban, it regains it when the country started gas export to China. As a result, the UNCTAD's export concentration index has reached at 0.74 and 0.94 in Kazakhstan and Turkmenistan in the end of the China-induced boom, respectively.

Behind the stronger concentration is there a change in structure in the trade with China and export competitiveness. Kazakhstan and Turkmenistan went through a major change in specialization of mineral fuels in the trade with China. While they depended on oil products and electricity from China in the 1990s, Kazakhstan surged crude oil exports to China in 1997 and Turkmenistan in 2010. The real appreciation accompanied by the boom made both exports and imports specialization stronger. Both countries can export only exportable goods that had strongly specialized in exports: copper, precious metal and iron and steel in Kazakhstan (Figure 8-17) and cotton and vegetable in Turkmenistan (Figure 8-18). Despite suffering from a decline, these products still retain comparative advantage in the world market (Figure 8-19, 8-20).

Australia and Mongolia also experienced a significant rise in the export concentration to mineral

fuels *and ores* during the global resource boom and China-induced boom. These two goods account for 58 percent and 82 percent in total export respectively in 2014. Accordingly, the UNCTAD's export concentration index increased to reach at 0.58 in Mongolia. While the index is smaller in Australia, it becomes 20 points larger in 2014 than 2001, indicating it is going through the export concentration.

As in Kazakhstan and Turkmenistan, both countries had not specialized in exports of mineral fuels in the trade with China while they had already done of ores, wool, and copper before the boom. Australia imported petroleum products and Mongolia depended on oil products and electricity to China. The real appreciation also made the specialization stronger, and only wool survives as export goods besides fuels ores, and copper (Figure 8-21, 8-22) while aluminum, precious metal, machine and electric equipment (in Australia) and apparel articles and iron and steel (in Mongolia) fell in import specialization (Figure 8-23, 8-24). Nonetheless, Australia retains competitiveness in precious metal, precious stone and meat and besides the above fuels and resources in the world market (Figure 8-25). This prevents export concentration from rising too much compared with Mongolia that retains competitiveness only in precious stones besides them (Figure 8-26).

Myanmar also changed the specialization of mineral fuel from import to export in the trade with China when it stated natural gas exports (Figure 8-27). However, it did not affect specialization in other tradable goods. Major exportable goods such as previous metals, wood, and ores had been already specialized in exports, and major import goods such as manufacturing and iron or steel articles in imports in the 1990s (Figure 8-28). Data availability inhibits us from concluding that the China-induced resource boom is associated with the export concentration.

In contrast, the concentration index rises only slightly in Indonesia despite a significant increase in the share of vegetable oil in total export. This implies that Indonesian economy keeps relatively higher adaptive capacity to resource price shock despite a loss of manufacturing competitiveness against China.

Indonesia had not specialized in exports of mineral fuels in the trade with China due to China's export surge in petroleum products. It does not completely specialized in exports even during the China-induced boom (Figure 8-29). This creates a sharp difference in the extent of real appreciation and change in trade specialization from other four countries. It did go through the specialization in imports of major exportable manufacturing goods such as machines, electrical equipment and chemicals, that used to be a main driving force of industrialization. But the speed is much slower than other countries (Figure 8-28). The slow specialization enables these products to keep comparative advantage in the world market despite a decline in the extent (Figure 8-30).

These findings suggest that except of Indonesia, the global resource boom and the

9

China-induced one added their vulnerability to resource price shock by *accelerated* specialization in exports of resource-based commodities and in imports of manufacturing sectors that had already in progress before the booms, or had gone through by massive imports of these products from China. While the China-induced boom changed the industrial competitiveness and structure in Indonesia, it has not severely affected its adaptive capacity to resource price shock so far.

6. Discussion

Vulnerability to resource price shock becomes apparent when a resource boom recedes. Declining export value after 2013 is associated with lower GDP growth, decelerating investment, and to a less extent consumption in Australia, Indonesia, Kazakhstan and Mongolia (Figure 8-5a~8-5d). Fiscal balance is deteriorated, turning into deficit even in Turkmenistan that gains a significant resource rent from pipeline gas export to China (Figure 8-8). Real appreciation along with the accelerated export specialization has deteriorated competitiveness in most of the exportable agricultural and manufacturing goods. This leads to a decline in the share of agriculture and manufacturing in the merchandize exports with a regain in 2014-15 by an increase of export volume (Figure 8-12). While a few resource-based products such as wool, cotton, and vegetable oil remain competitive, most of them generate low added value and learning spillover effect.

Indonesia retains several labor-intensive manufacturing products that are competitive in the world market. This accrues to the relatively low real appreciation, smaller natural resource endowment per capita, less complementary with Chinese import specification except of coal (Garnaut 2015), and use of resource rent to invest in agricultural development (Bature 2013) for the purpose of self-sufficiency for paddy rice and tight fiscal control. Sufficient domestic rice production helps stabilize food price, preventing labor cost from becoming too high for manufacturing sector to be competitive, like in Africa. Structural adjustment imposed by IMF and the World Bank in the 1980s and the requirement for fuel subsidy reform by IMF at the time of 1997-8 Asian financial crisis made Indonesian government strengthen fiscal discipline (Mori 1997), restricting the spending effect. This enables the country to escape from 'hollowing-out' of manufacturing: that is, a decline of domestic value addition in total output (Banga 2014) (Figure 8-31).

Nonetheless, the China-induced resource boom has weakened their resilience to resource price shock in all the six countries including Indonesia. Growth of agricultural and manufacturing export becomes no more powerful as to balance the decline in the real purchasing power of resource exports in Australia, Indonesia, Kazakhstan and Mongolia (Figure 8-32a, 32b, 32c and 32d). An increase in RCA in vegetable oil and rubber (Figure 8-8c) does not help reduce the vulnerability in Indonesia as these products are also hit by the decline in the global price at the same time.

Mongolia even loses half of foreign reserve and suffers from stagnant and inflation that are brought about by nominal currency depreciation.

Energy exporting countries are primarily responsible for the real appreciation. They regarded the boom permanent and have done little systematic attempts to hold back the large amount of resource revenue for use after the boom. The resource to cash program in Mongolia, that directly allocated windfall resource revenue to specific priority programs simply expanded government spending, generating higher inflation and increasing foreign debt stock (Yeung and Howes 2015). Kazakhstan allocated most of the gains directly to supporters through a fuel subsidy (Luong and Weinthal 2010). While Indonesia allocated part of the increased revenue for *cutting* fuel subsidies, it spent most of them as soon as it arrived, generating a fiscal deficit. Australia and Indonesia continue ad valorem royalties and has not changed into a profit-based royalty system that is more economically efficient under the private ownership. The myopic perception made them retard efforts to increase productivity and competitiveness in both resource and non-resource export sectors during the boom.

Despite the inducement of the resource boom, however, China has done little to help them to escape from the Dutch disease and to rescue their economic distress. What Chinese government has do so far is to conclude a bilateral currency swap agreement with Mongolia in 2011 with the size of CNY 15 billion yuan (US$2.18 billion) and its extension by every three years. Still it is implemented as a part of internalization strategy of its currency, not for the purpose of compensating the adverse impact. This makes Mongolia rush into the IMF, World Bank and Asian development Bank to ask for a rescue to repay the external debt that has been accumulated to finance their investment and consumption (Figure 8-11). Chinese government provides no financial assistance and allows no cancellation of the loan repayment.

This stance has implications to Turkmenistan and Kazakhstan that developed land gas pipeline with the loans from the China Development Bank and the Export-Import Bank of China. Both countries are repaying these loans by selling natural gas to China at a lower price than internationally referential one at the time of contract. They have to sell it at the low price beyond the contract period or at a much lower price if China reduces gas imports, unless the contract has the take-or-pay clause. This will make the adverse impact of the Dutch disease severer, leading to an economic ruin and political turmoil that are happening in Venezuela, where the government uses oil revenue to subsidize life for citizens in unsustainable way in exchange of regulating every aspects of daily life (Gallegos 2016). Again, Chinese government offered no financial rescue to Venezuela despite its huge amount of loan provision under the debt-for-oil contract.

Chinese government also encourages its companies to make direct investment in energy-exporting countries to help them enhance productivity-raising activities. But it poses a risk

11

of generating adverse impact on livelihood and ecology, and the pollution haven by increasing carbon emission at the host countries (chapter 10 and 11 in this volume).

7. Conclusions

This chapter aims to explore whether the global resource boom and the China-induced one caused Dutch disease in the six Asian-Pacific energy-exporting countries, and what they have addressed to escape from it. It draws three conclusions.

First, macroeconomic indicators show that all the six countries have been infected by the Dutch disease, but to a varied extent. While Mongolia was hit hardest with significant fluctuation in the boom, Indonesia was much less affected. Australia and Kazakhstan enjoyed the higher resource prices for so long a time that they left a real appreciation unaddressed, which brought a severer impact.

Second, except of Indonesia, they have increased vulnerability to external resource price shock during the boom as the boom *accelerated* specialization and export concentration that had already gone through before the resource boom. While the China-induced resource boom weakened the industrial competitiveness that brought about the change in industrial structure in Indonesia, it has not seriously harmed the adaptive capacity to resource price shock.

Finally, China has provided little effective measures and supports for them to prevent the Dutch disease and to counteract its adverse impacts despite inducement of the resource boom.

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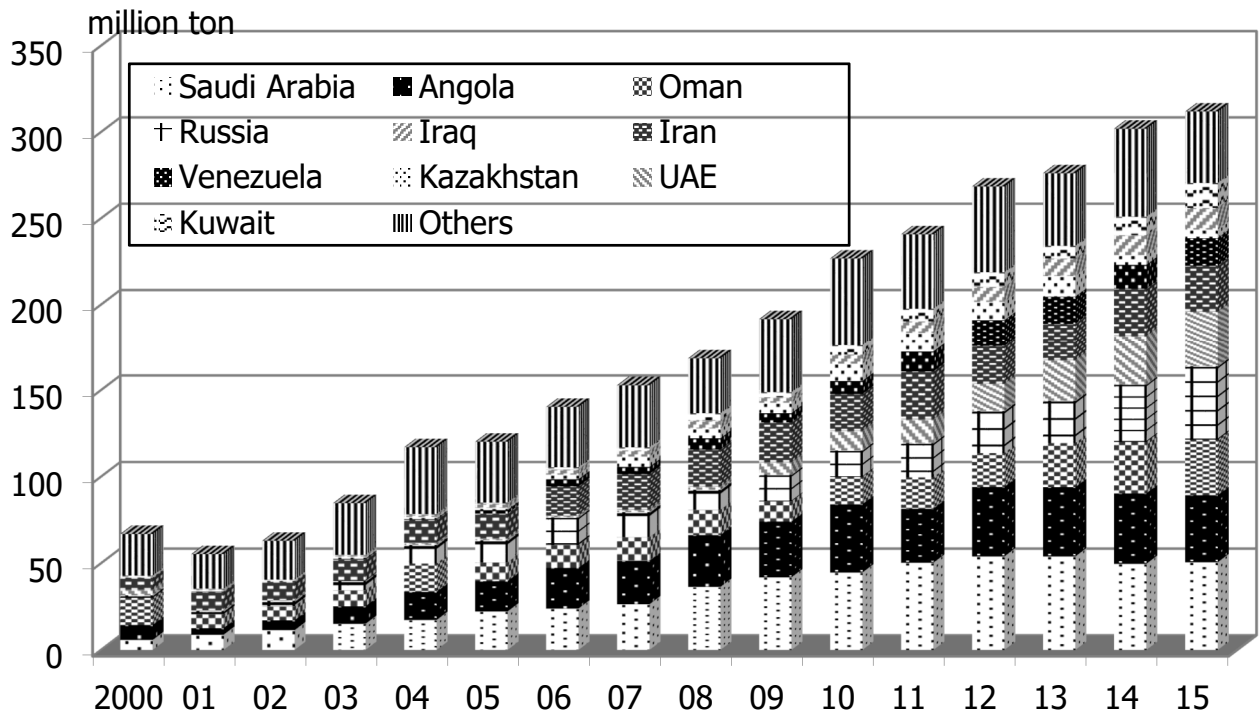
Figure 8.1 China's oil imports by exporters

Source: Author compilation based on China Customs
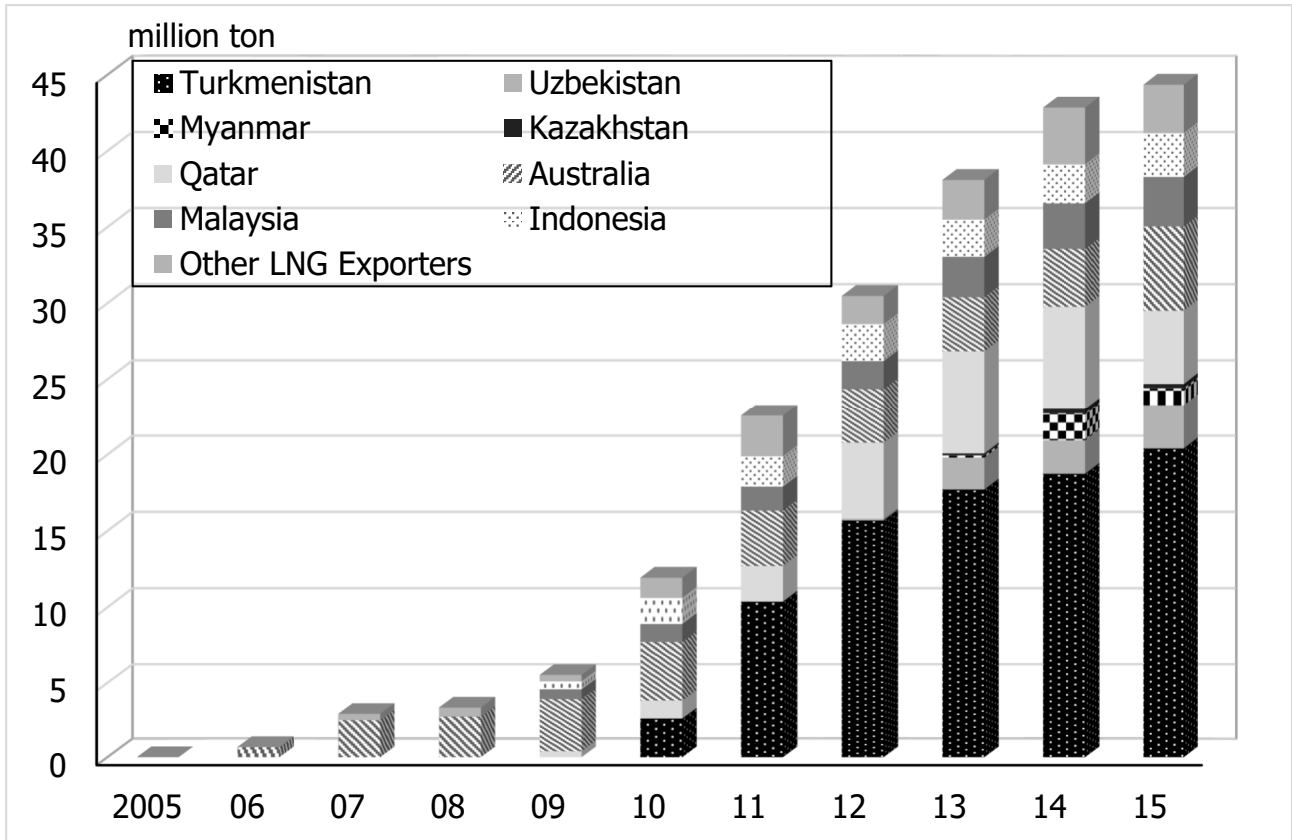
Figure 8.2 China's pipeline gas and LNG imports by exporters

Source: Author compilation based on China Customs
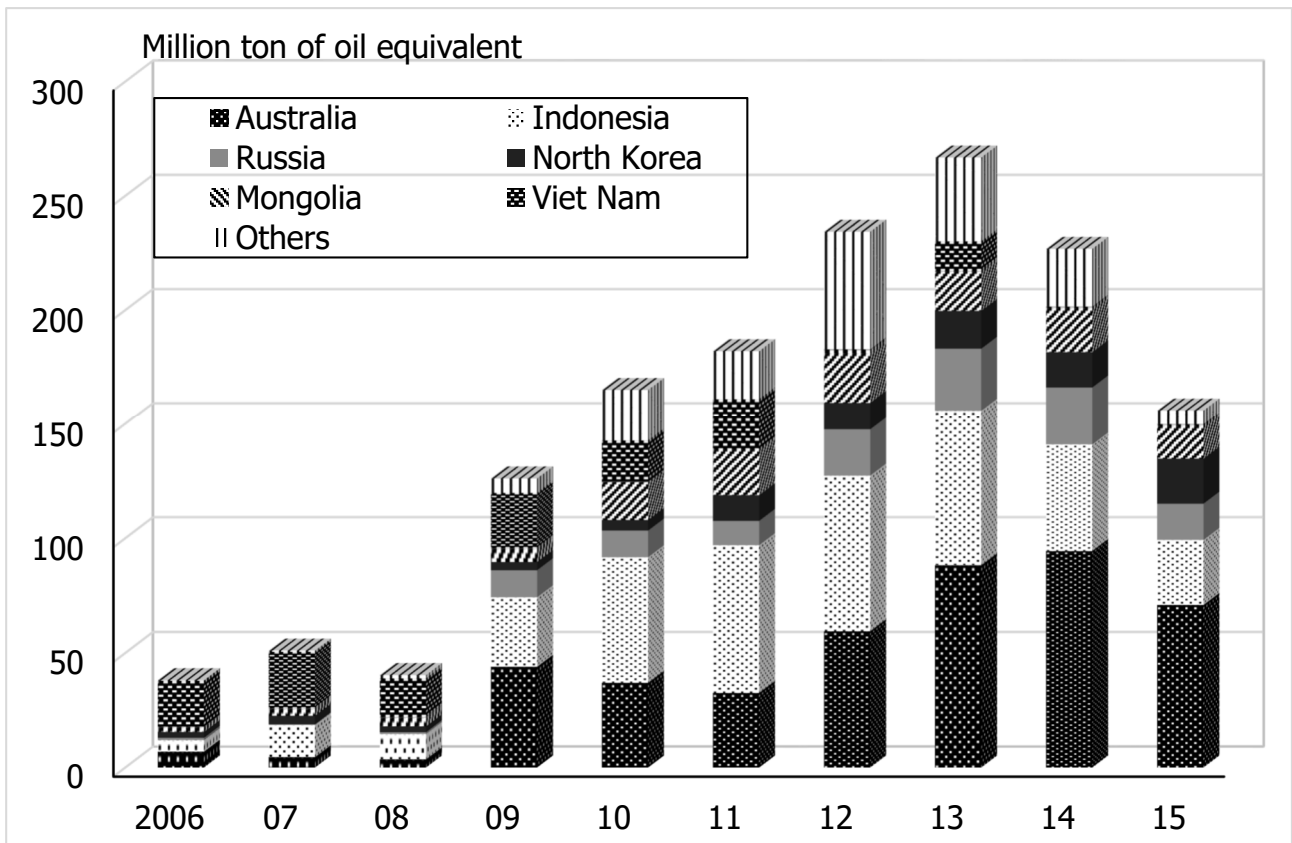
Figure 8.3 China's coal imports by exporters

Source: Author compilation based on China Customs.
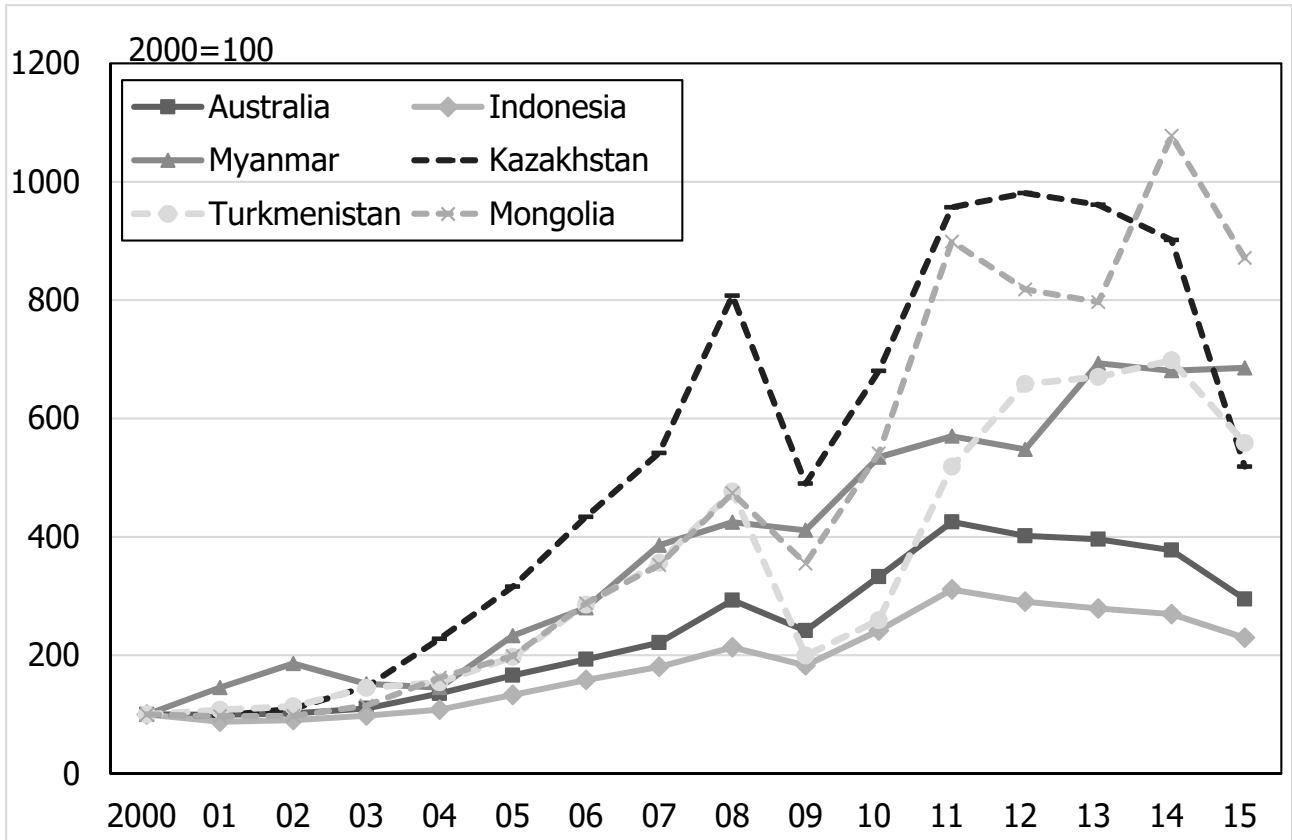
Figure 8.4 Export value index in the six countries
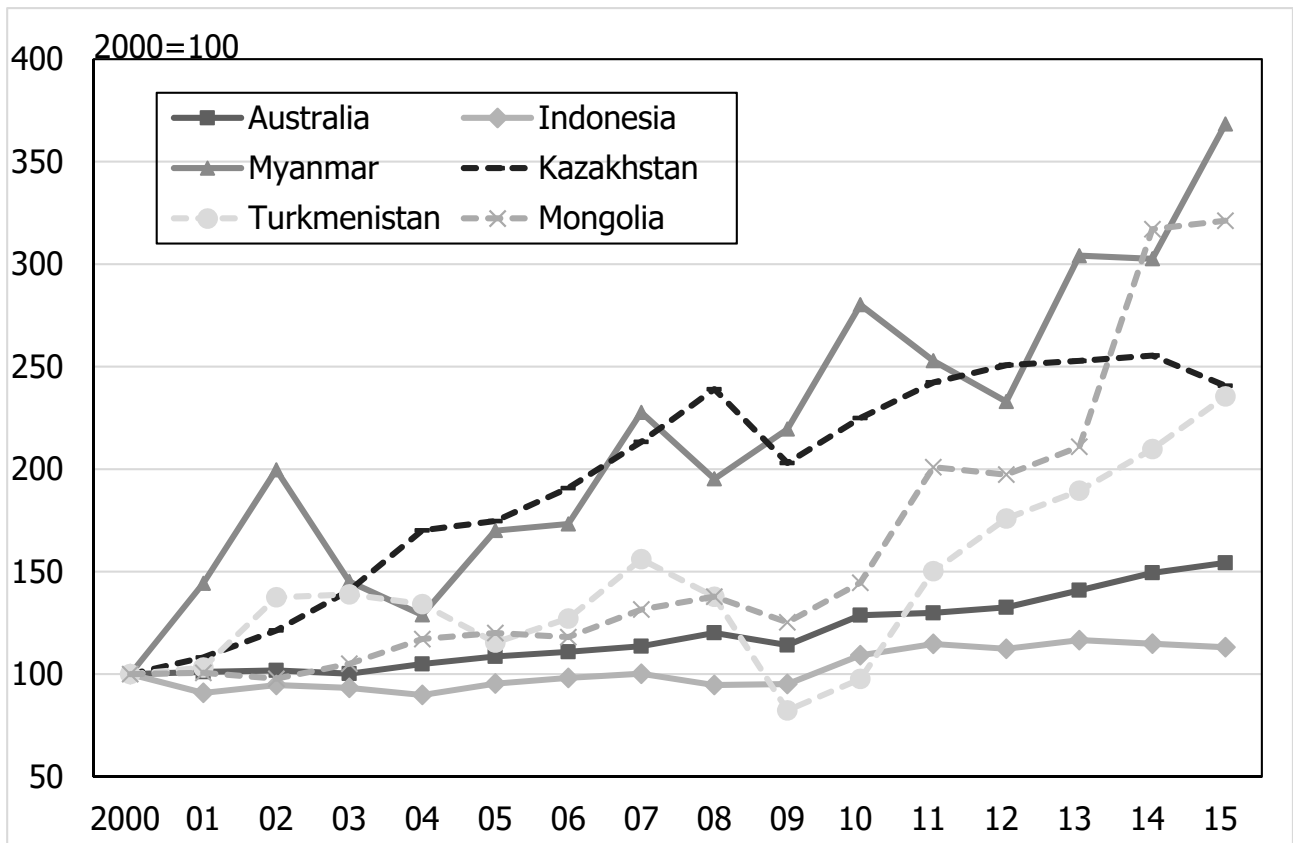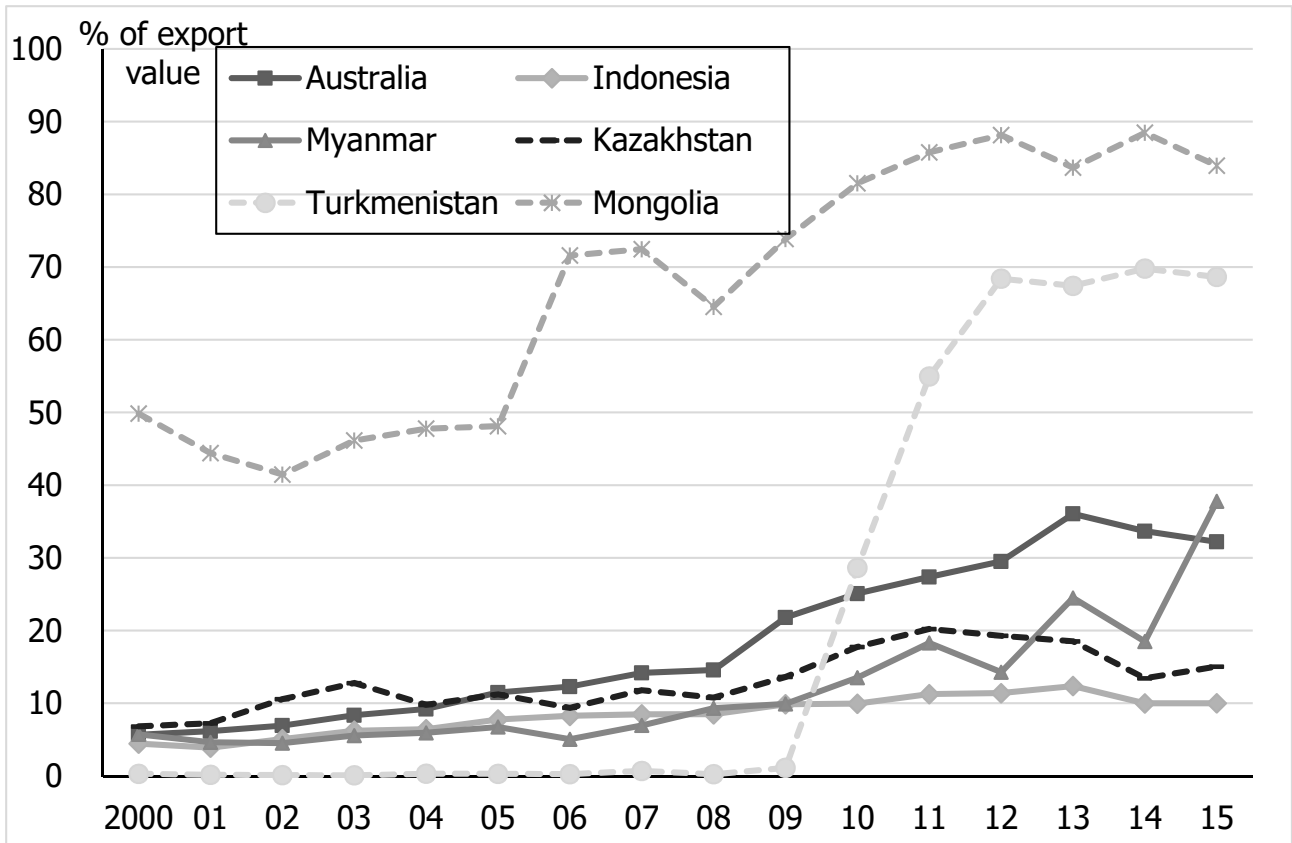
Source: Author compilation based on World Bank (2017).
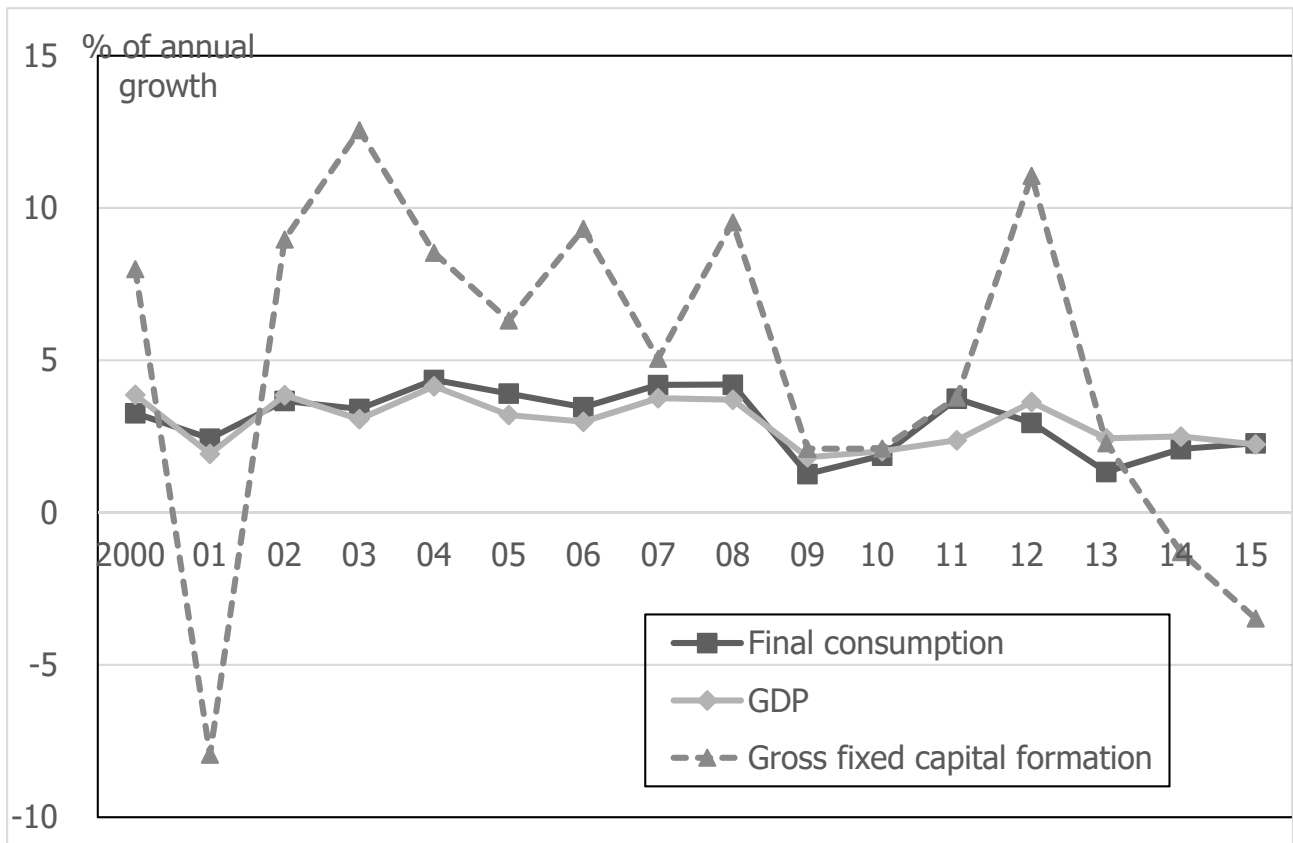
Figure 8.5a Annual growth of final consumption, GDP and gross fixed capital formation in Australia

Source: Author compilation based on World Bank (2017).
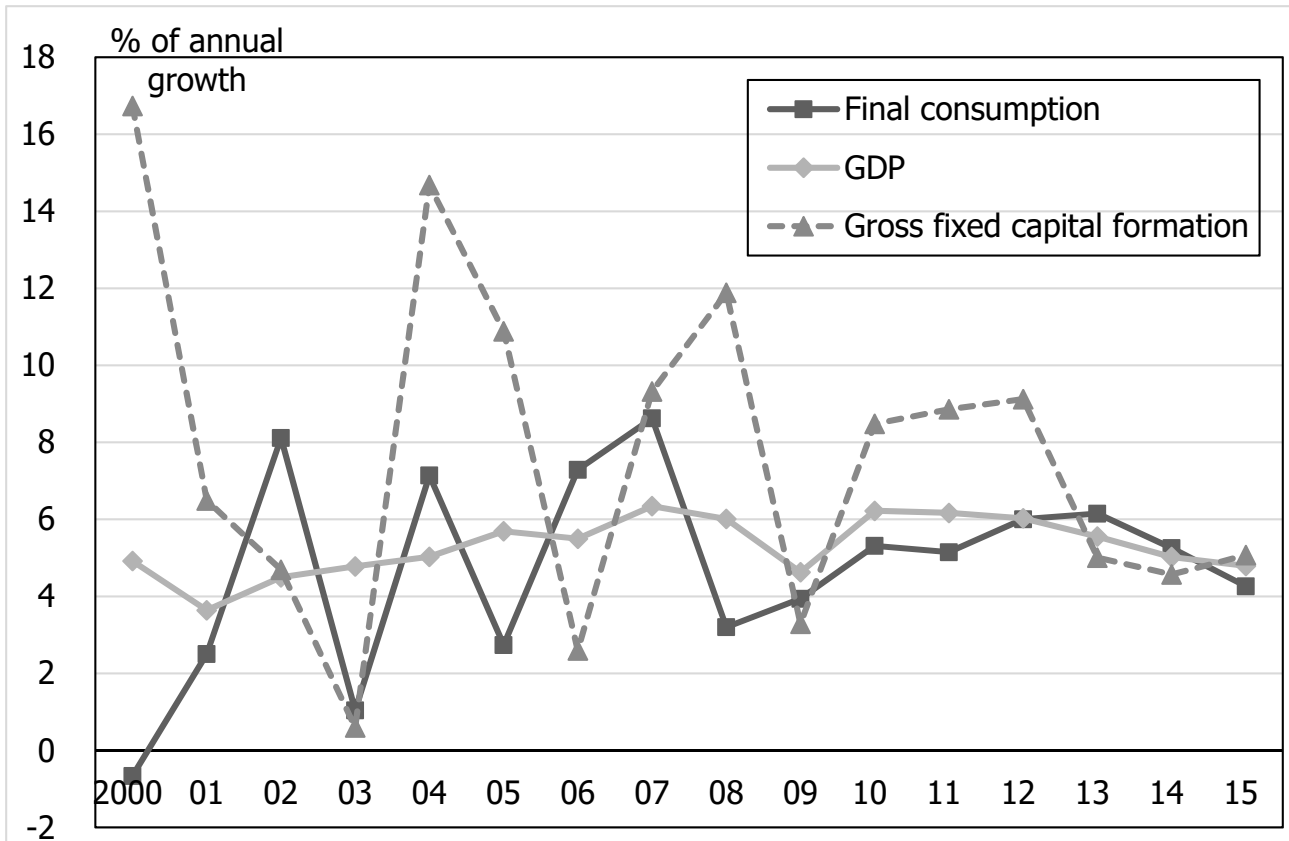
Figure 8.5b Annual growth of final consumption, GDP and gross fixed capital formation in Indonesia

Source: Author compilation based on World Bank (2017).
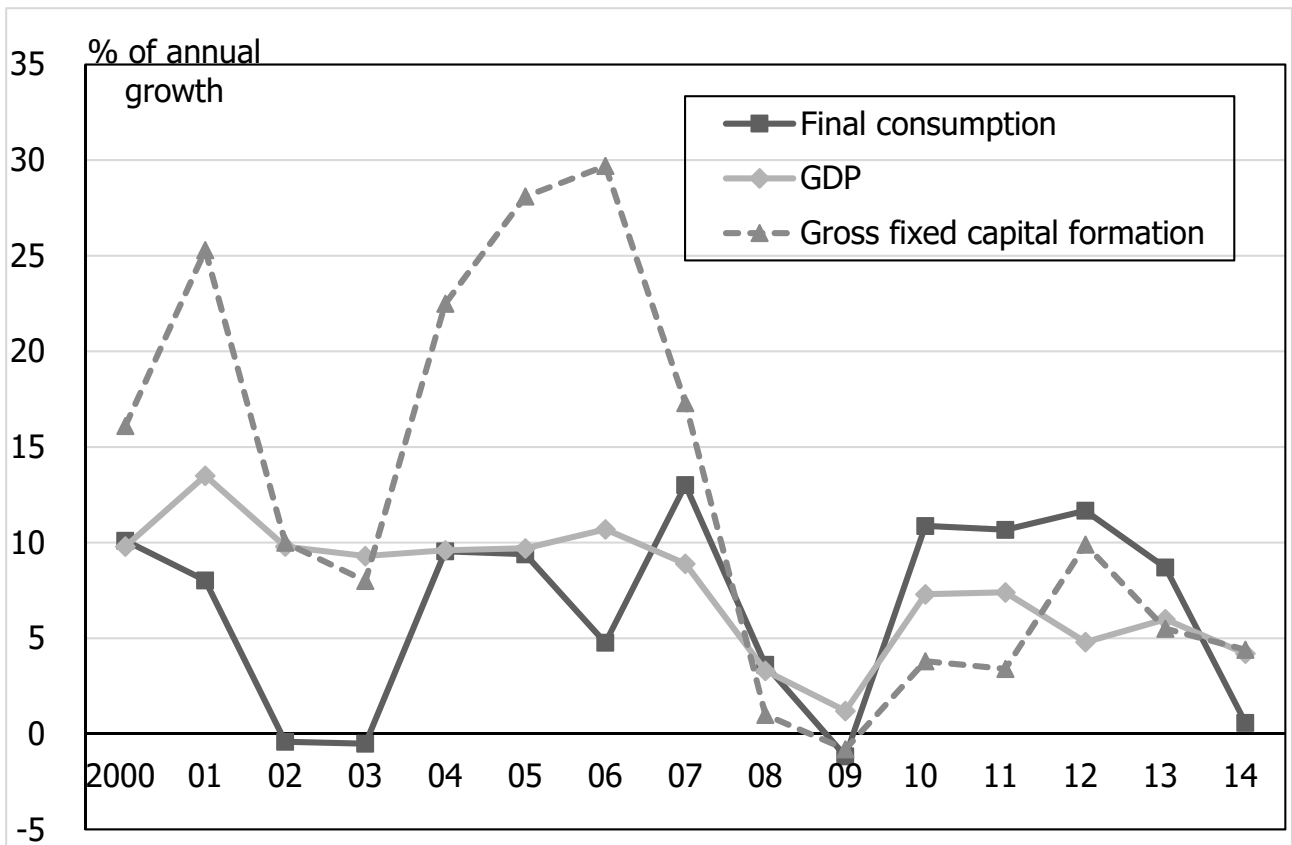
Figure 8.5c Annual growth of final consumption, GDP and gross fixed capital formation in Kazakhstan

Source: Author compilation based on World Bank (2017).
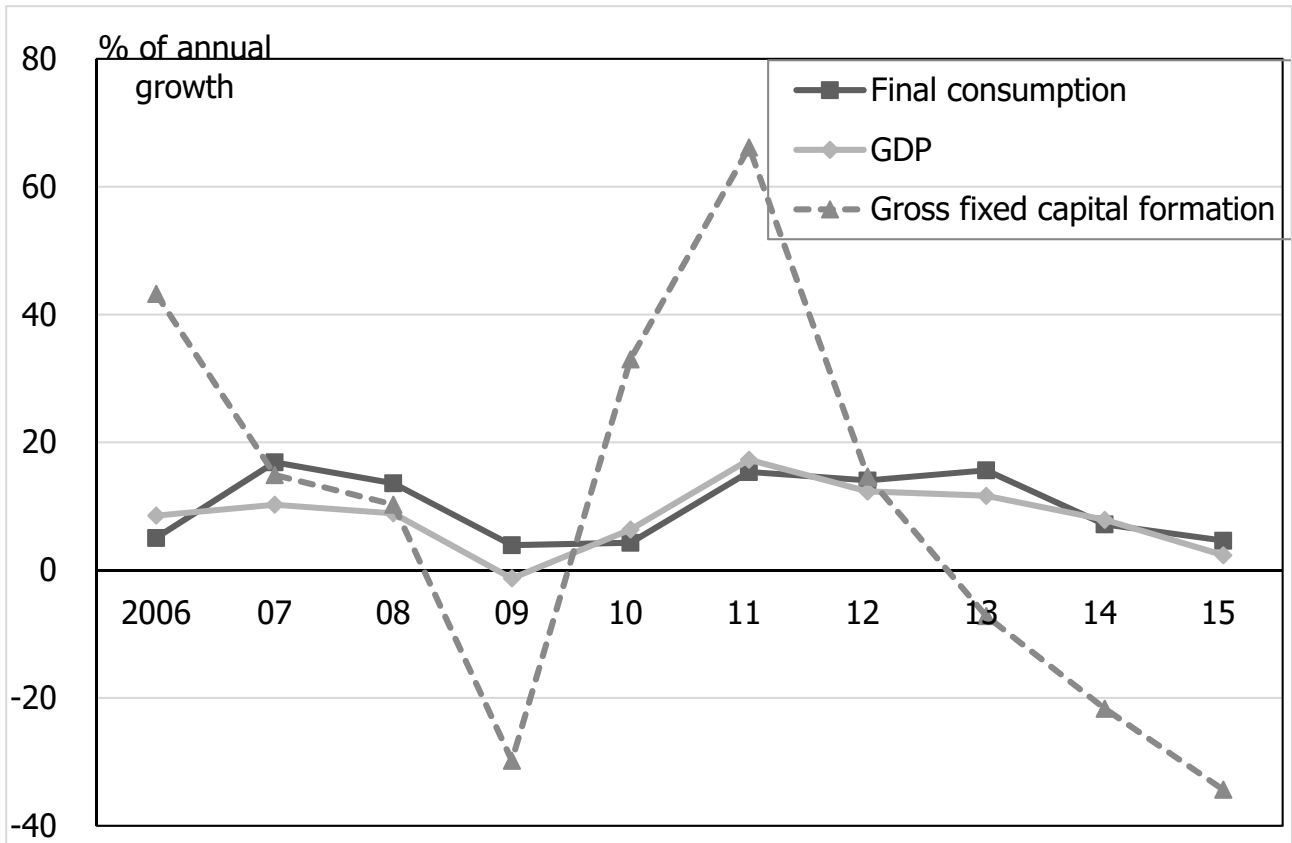
Figure 8.5d Annual growth of final consumption, GDP and gross fixed capital formation in Mongolia

Source: Author compilation based on World Bank (2017).
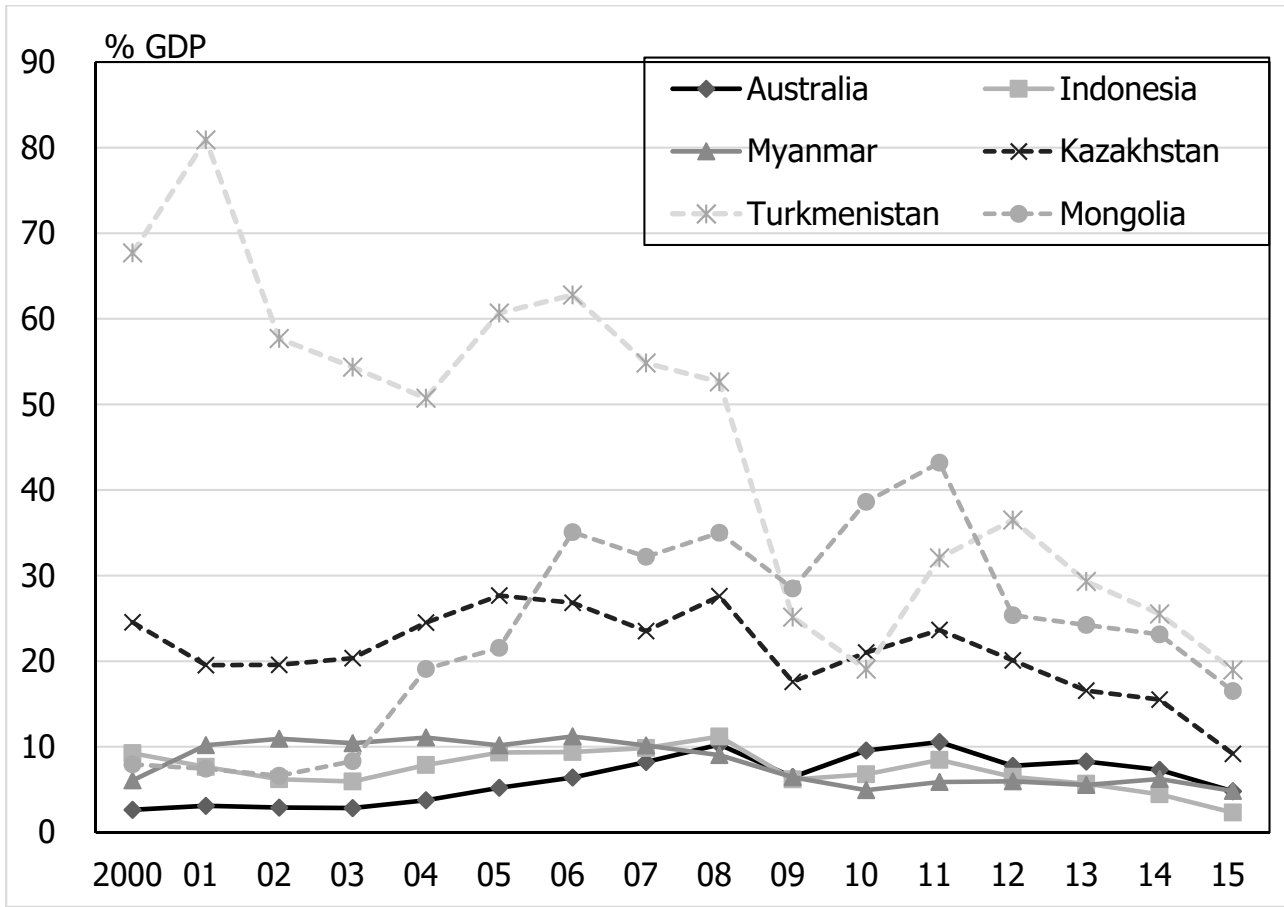
Figure 8.6 Total rent revenue from natural resources

Source: Author compilation based on World Bank (2017).
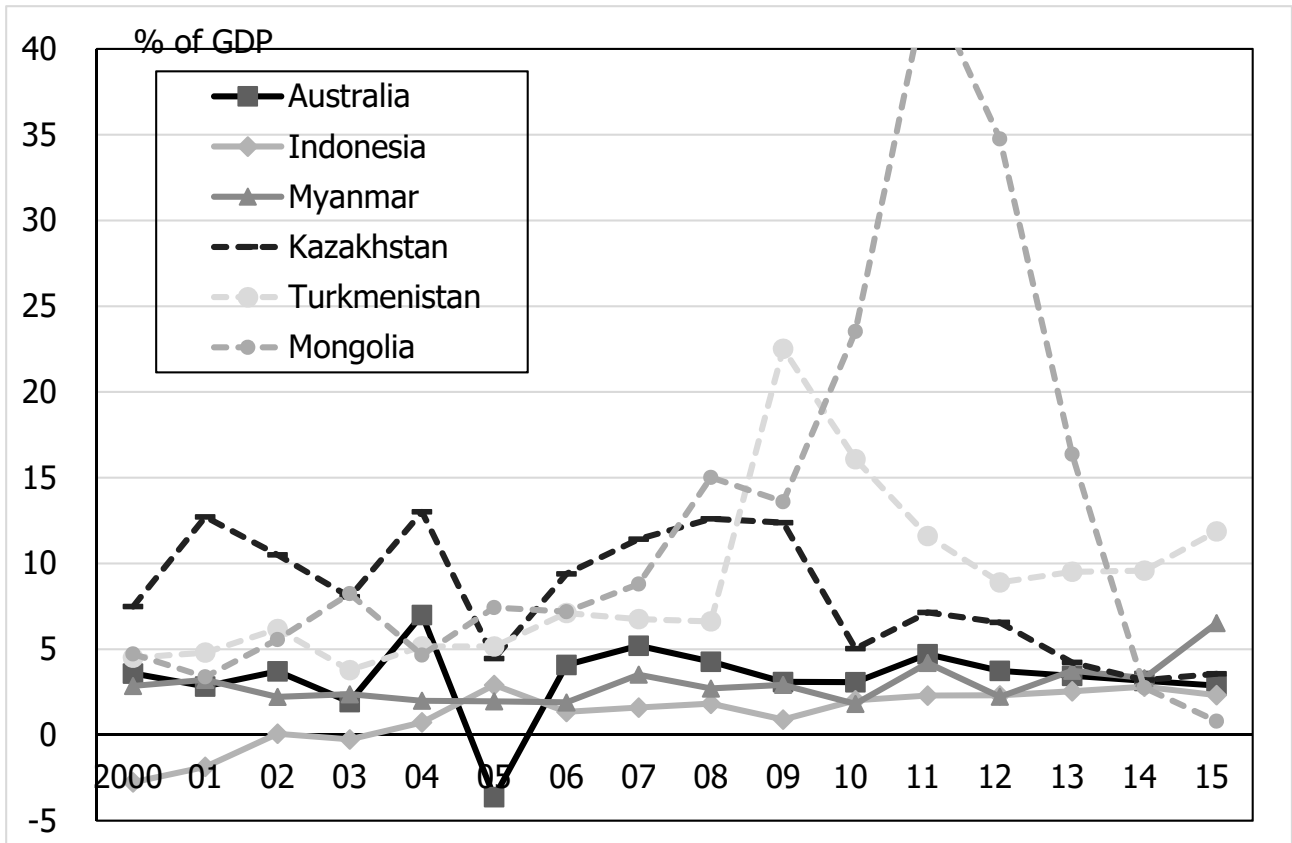
Figure 8.7 Net inflow of foreign direct investment in the six countries

Source: Author compilation based on World Bank (2017).
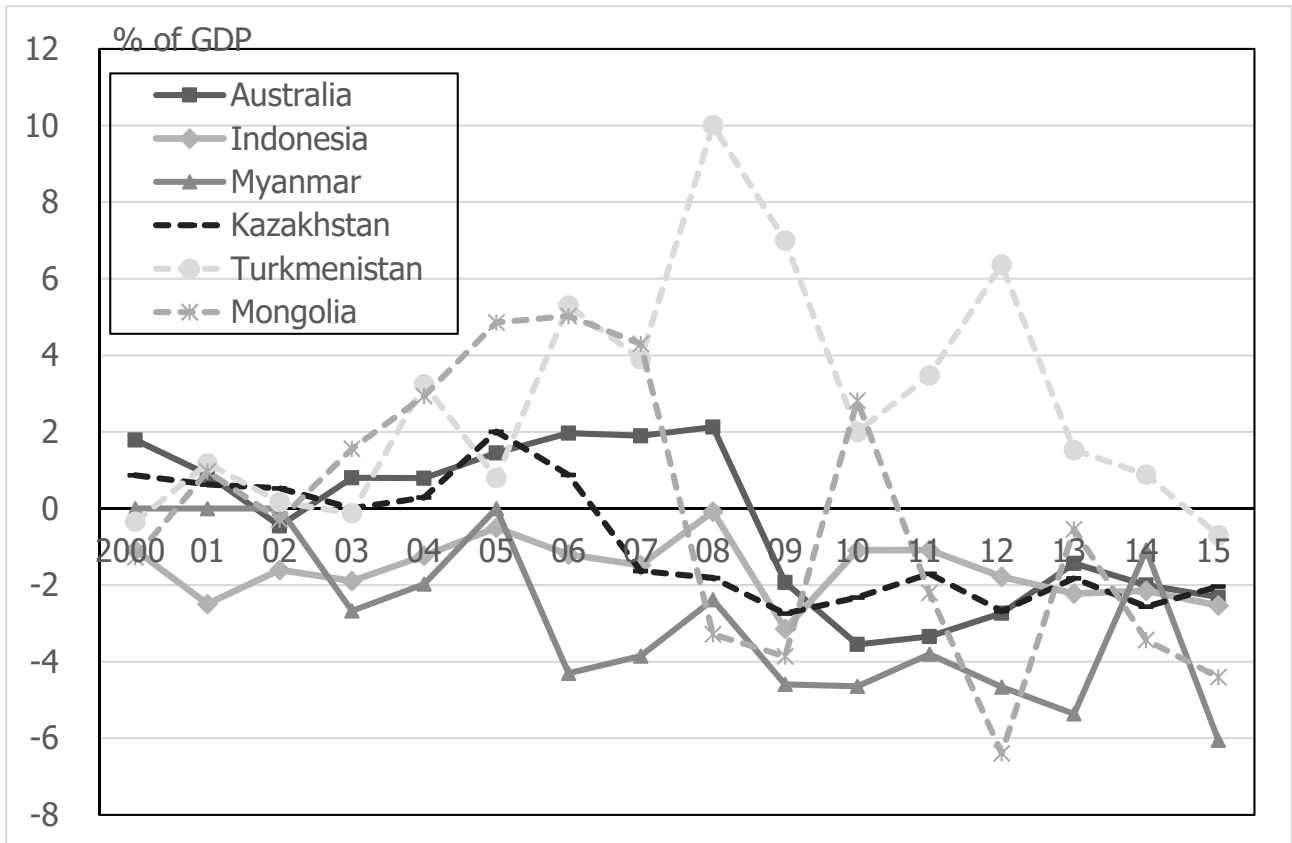
Figure 8.8 Fiscal balance in the six countries

Source: Author compilation based on Asian Development Bank (2017) and IMF (2016).
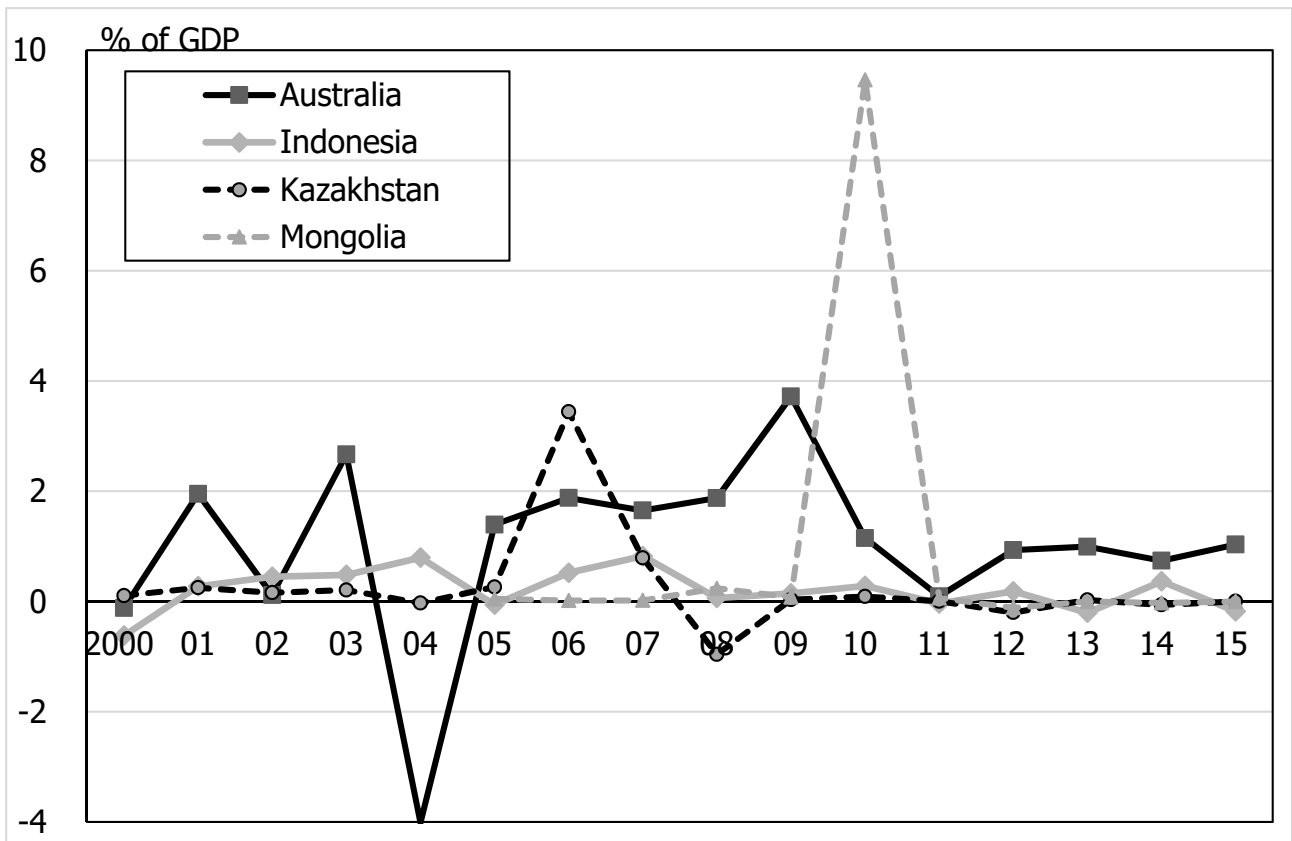
Figure 8.9 Net inflow of foreign portfolio investment in Australia, Indonesia, Kazakhstan and Mongolia

Source: Author compilation based on World Bank (2017).
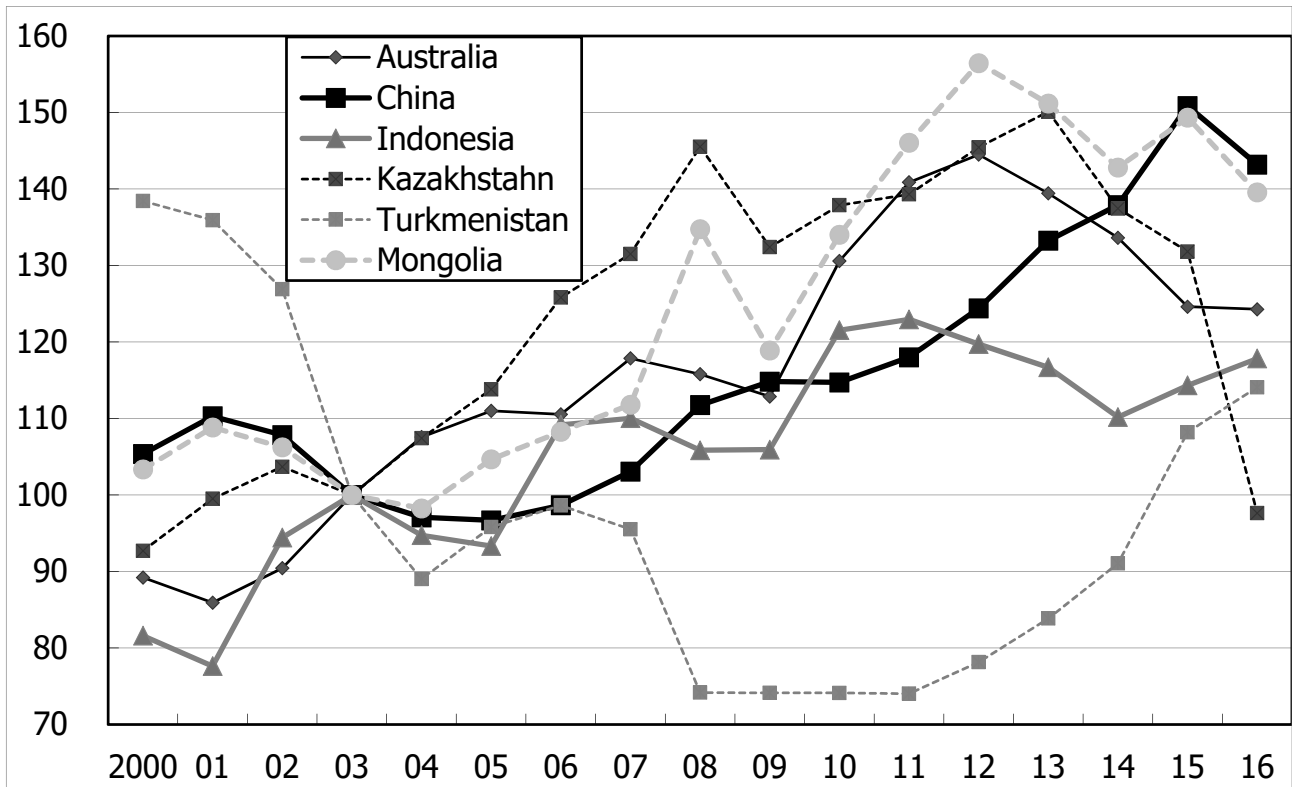
Figure 8.10 Real effective exchange rate in the six countries

Note: 2003=100

Source: Author compilation based on http://bruegel.org/publications/datasets/real-effective-exchange-rates-for-178-countries-a-new-data base/
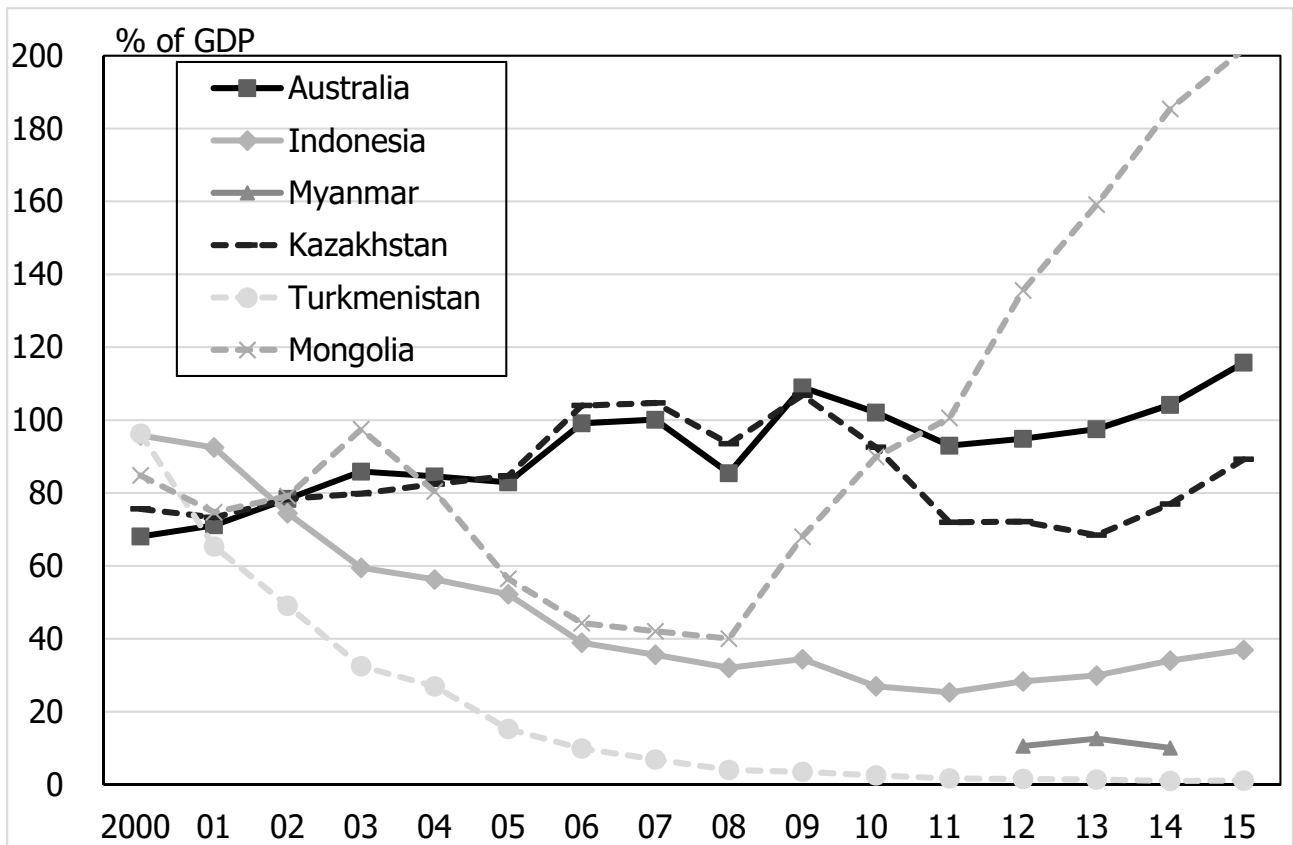
Figure 8.11 Foreign debt stock in GDP in the six countries

Source: Author compilation based on World Bank (2017).
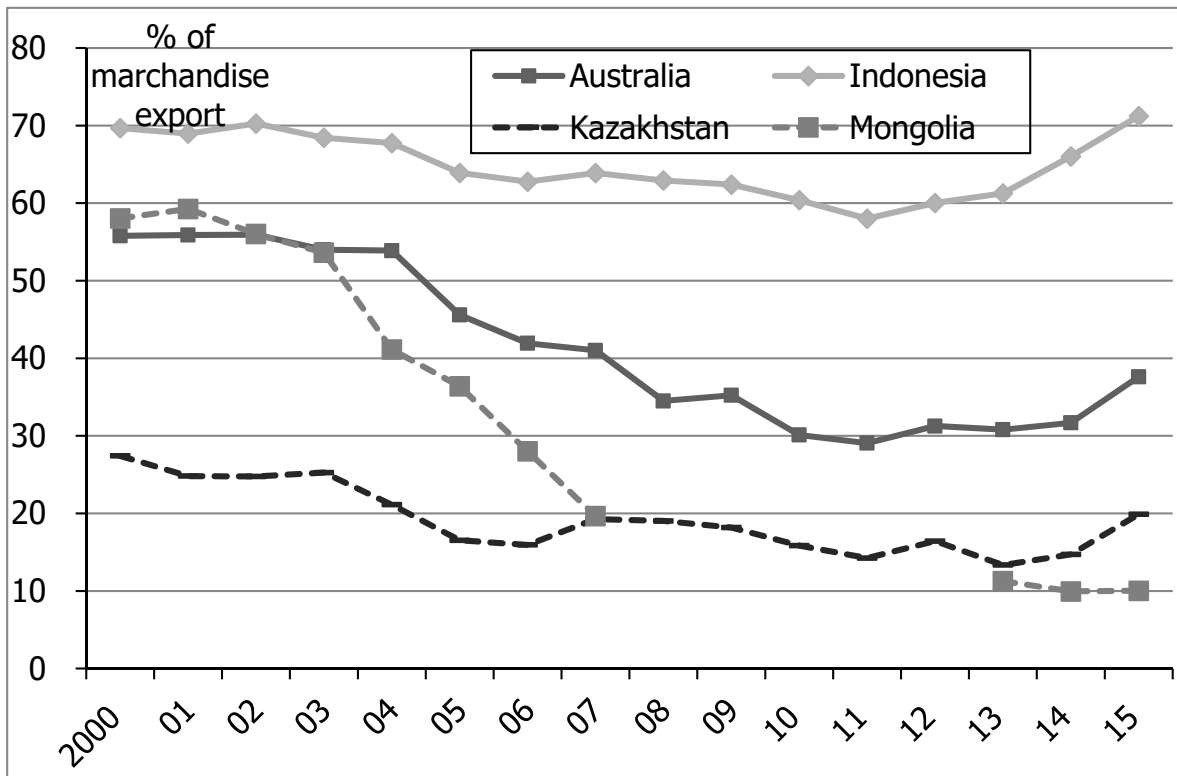
Figure 8.12 Share of agriculture and manufacturing products in the merchandise export

Source: Author compilation based on World Bank (2017).
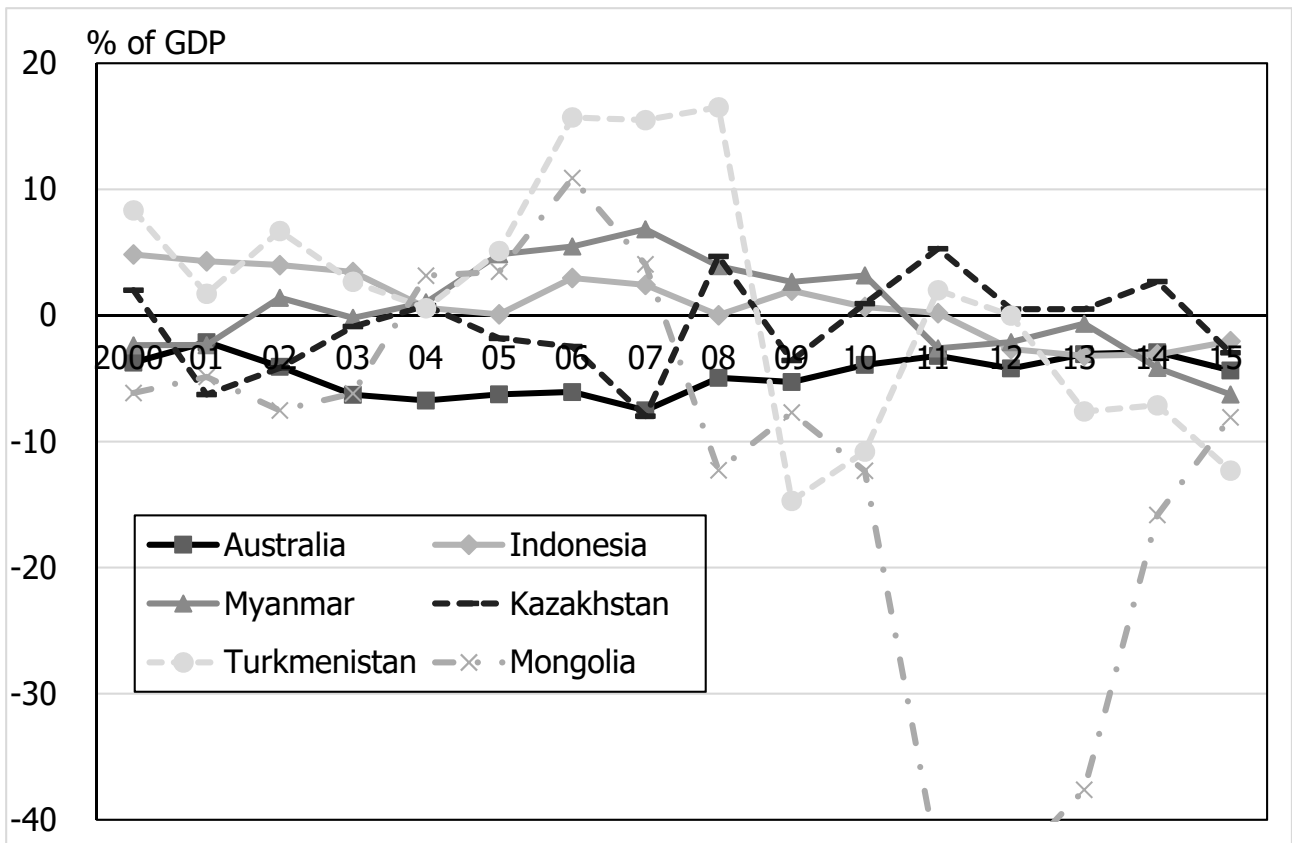
Figure 8.13 Current account in GDP in the six countries

Source: Author compilation based on World Bank (2017).

Figure 8.14 Export volume index in the six countries

Source: Author compilation based on World Bank (2017).

Figure 8.15 Export dependence on China

Source: Source: Author compilation based on IMF (2007; 2016; 2017).
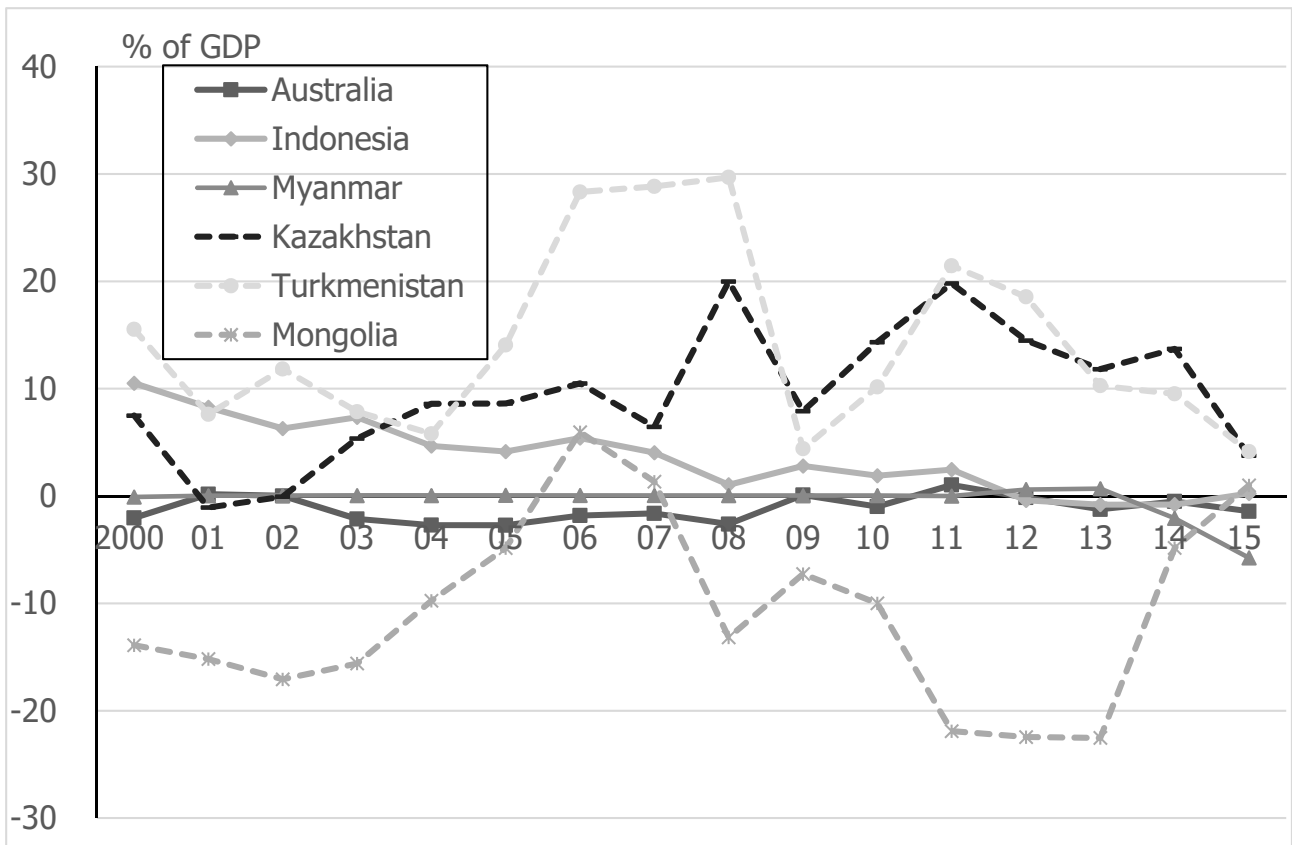
Figure 8.16 Merchandise trade balance in the six countries

Source: Author compiled based on World Bank (2017).
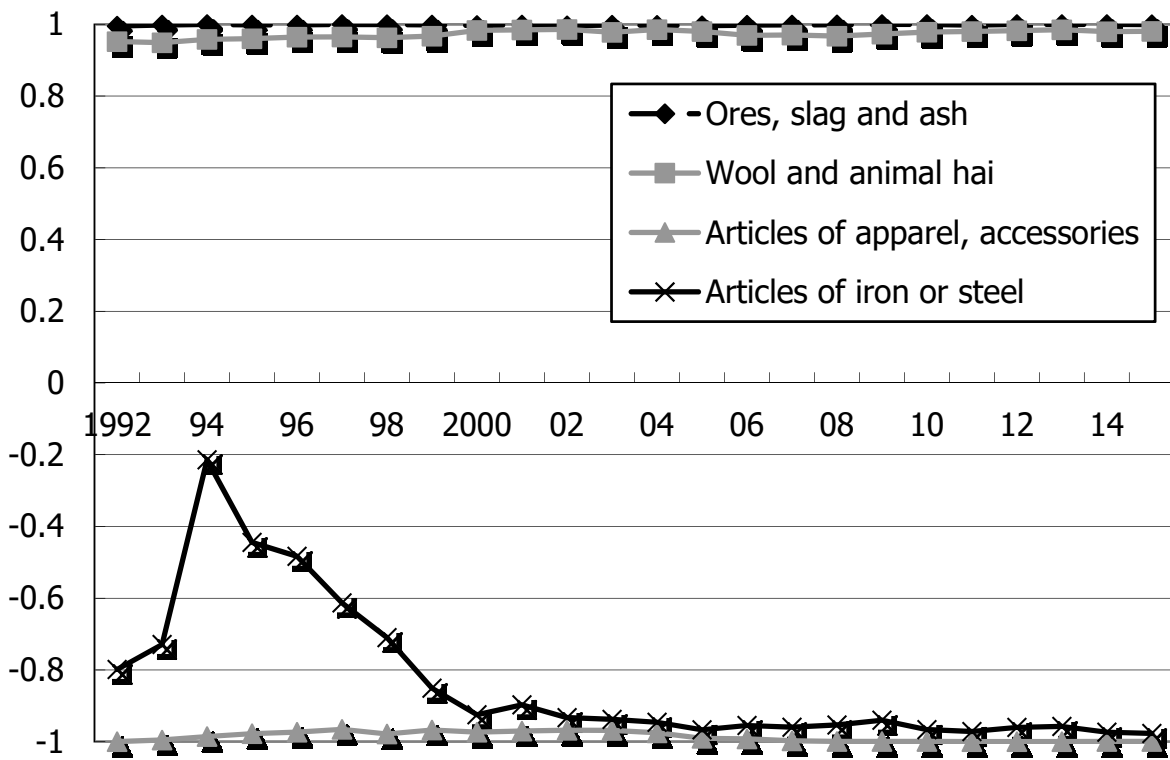
Figure 8.17a TSC of perpetuated specification subsectors in Australia
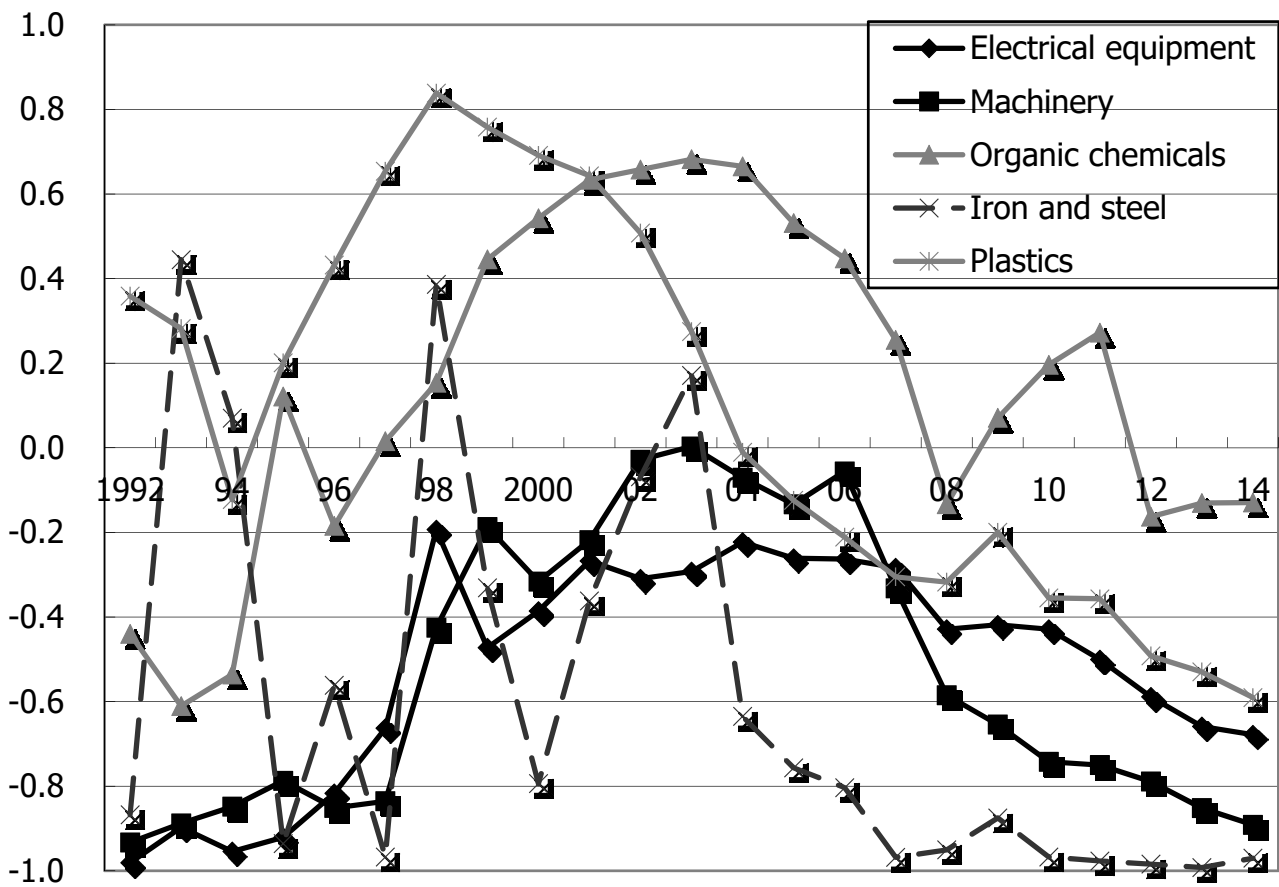
Source: Author calculation based on UN ComTrade database.
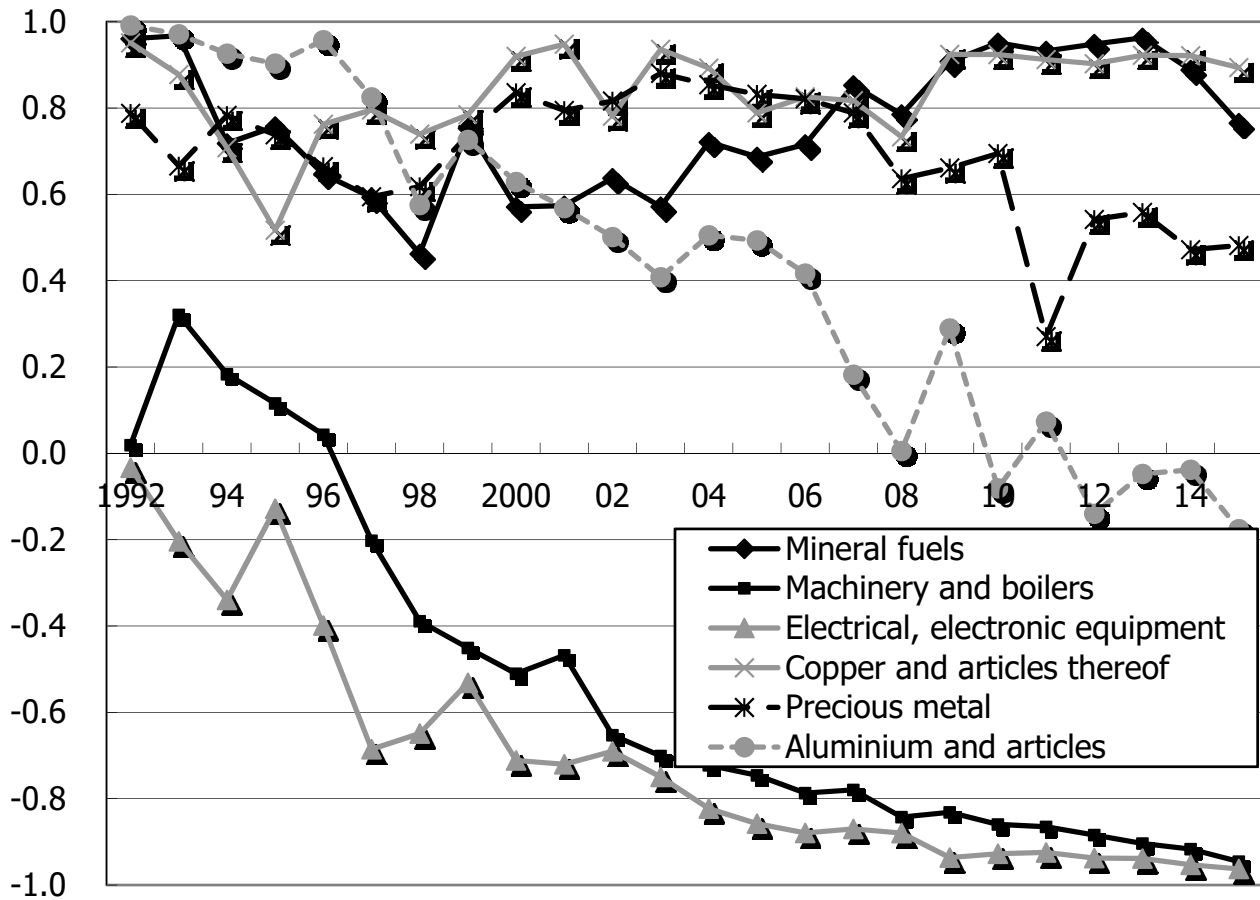
Figure 8.17b TSC in changing specialization sectors in Australia

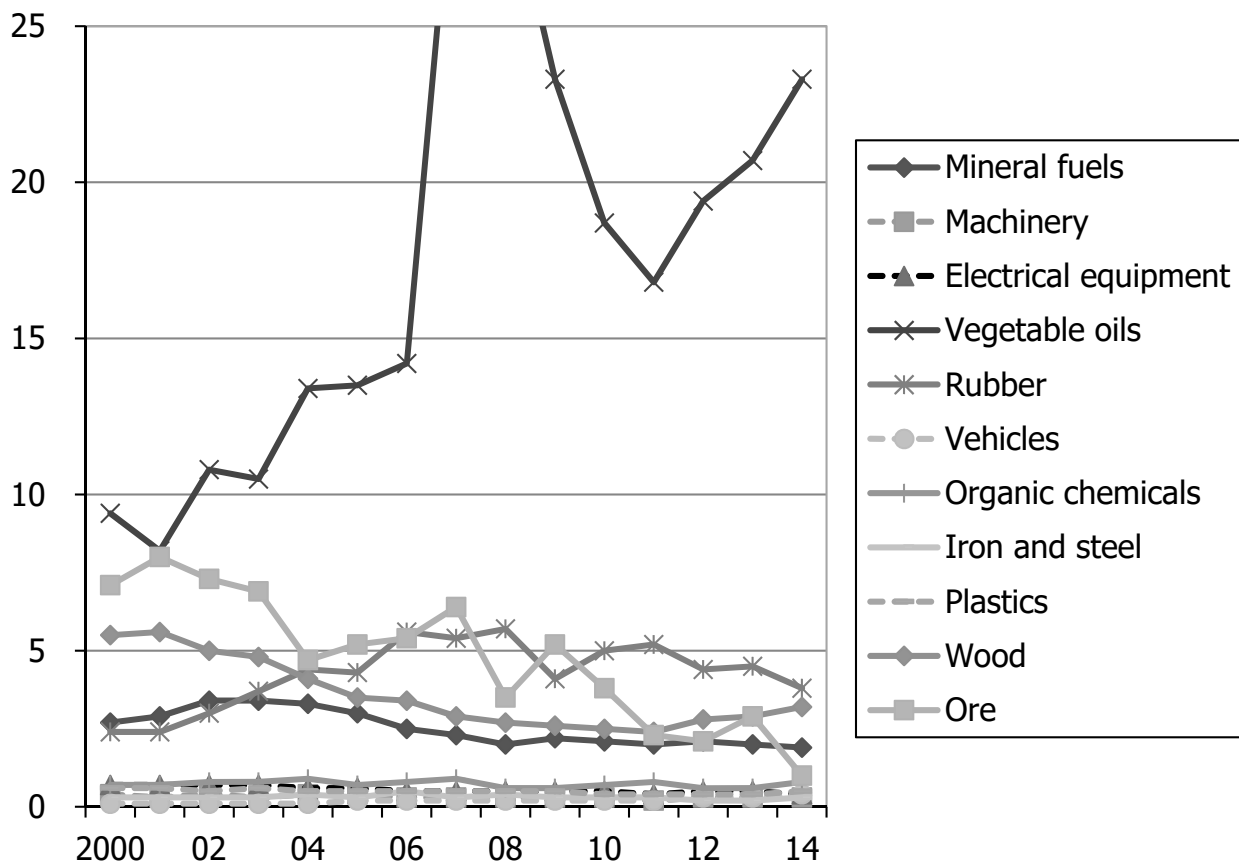Source: Author calculation based on UN ComTrade database.
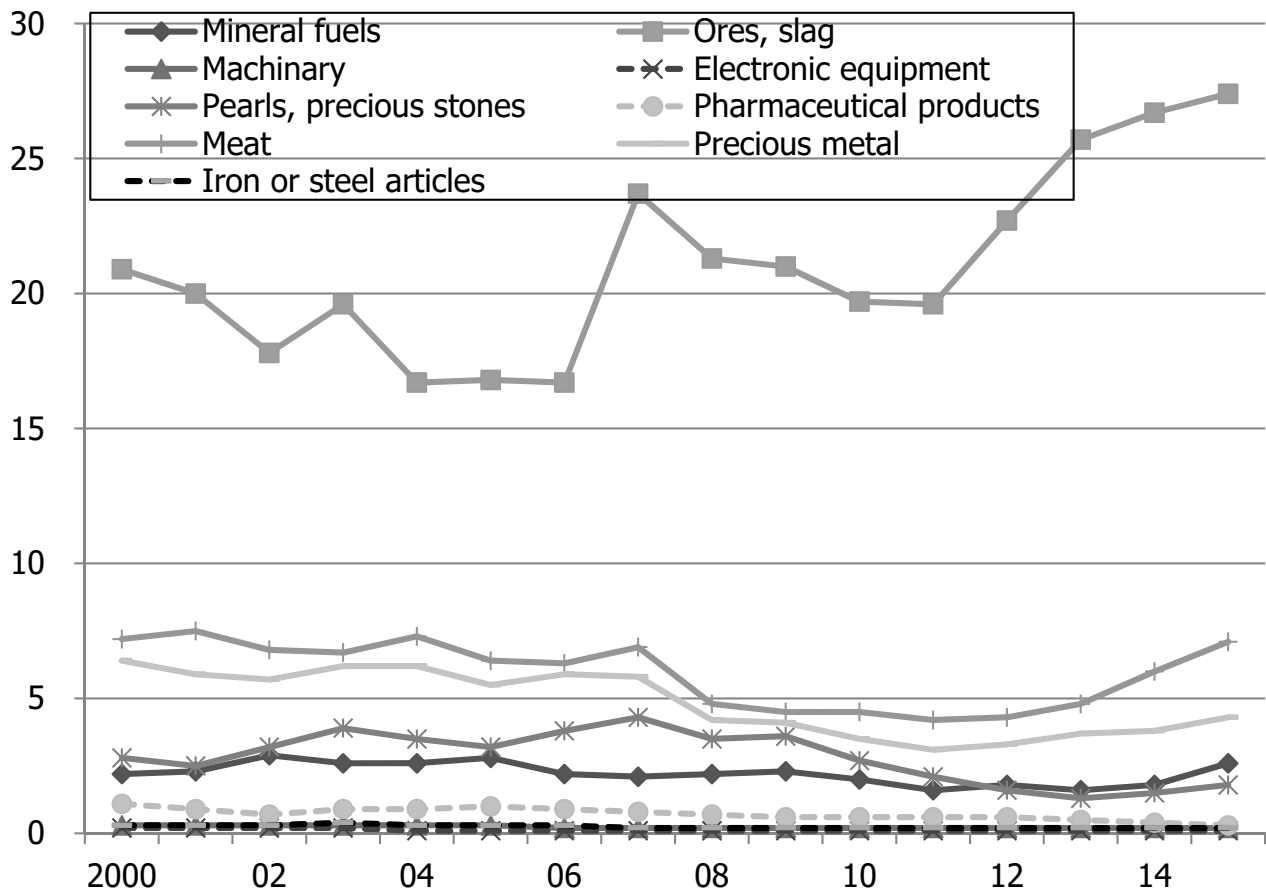
Figure 8.17c Relative comparative advantage (RCA) of Australian top ten traded goods

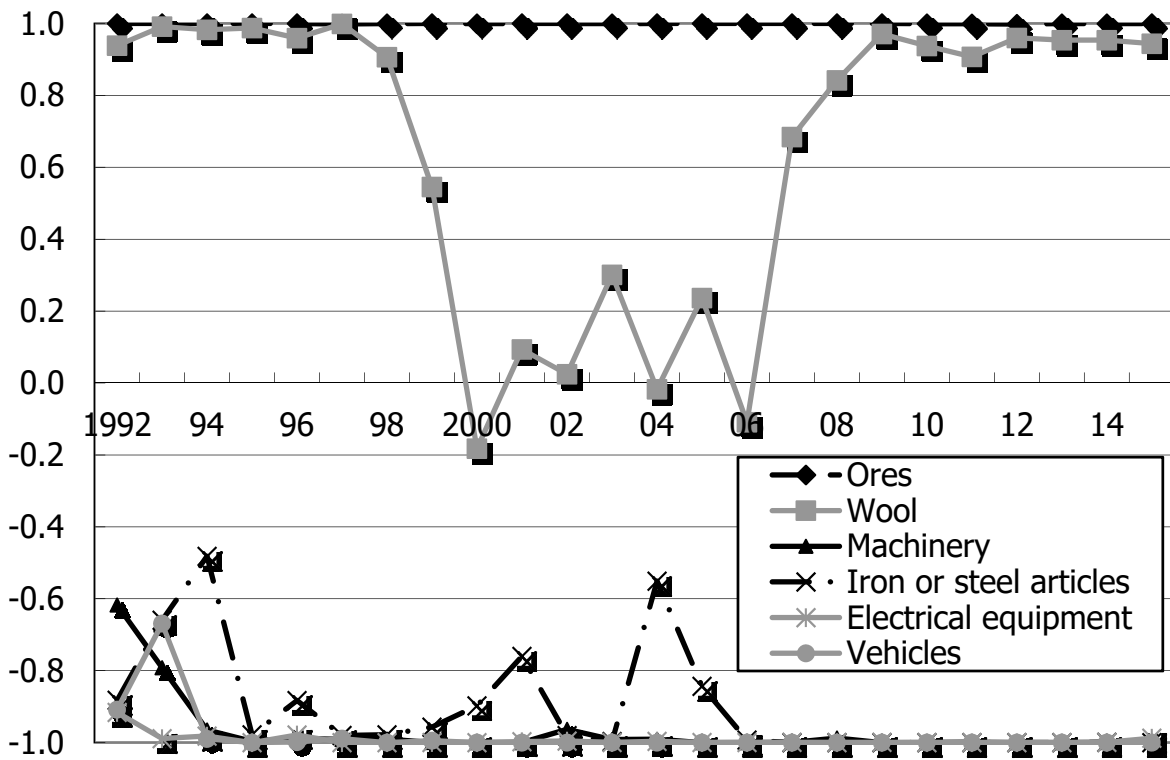Source: Author calculation based on UN ComTrade database.
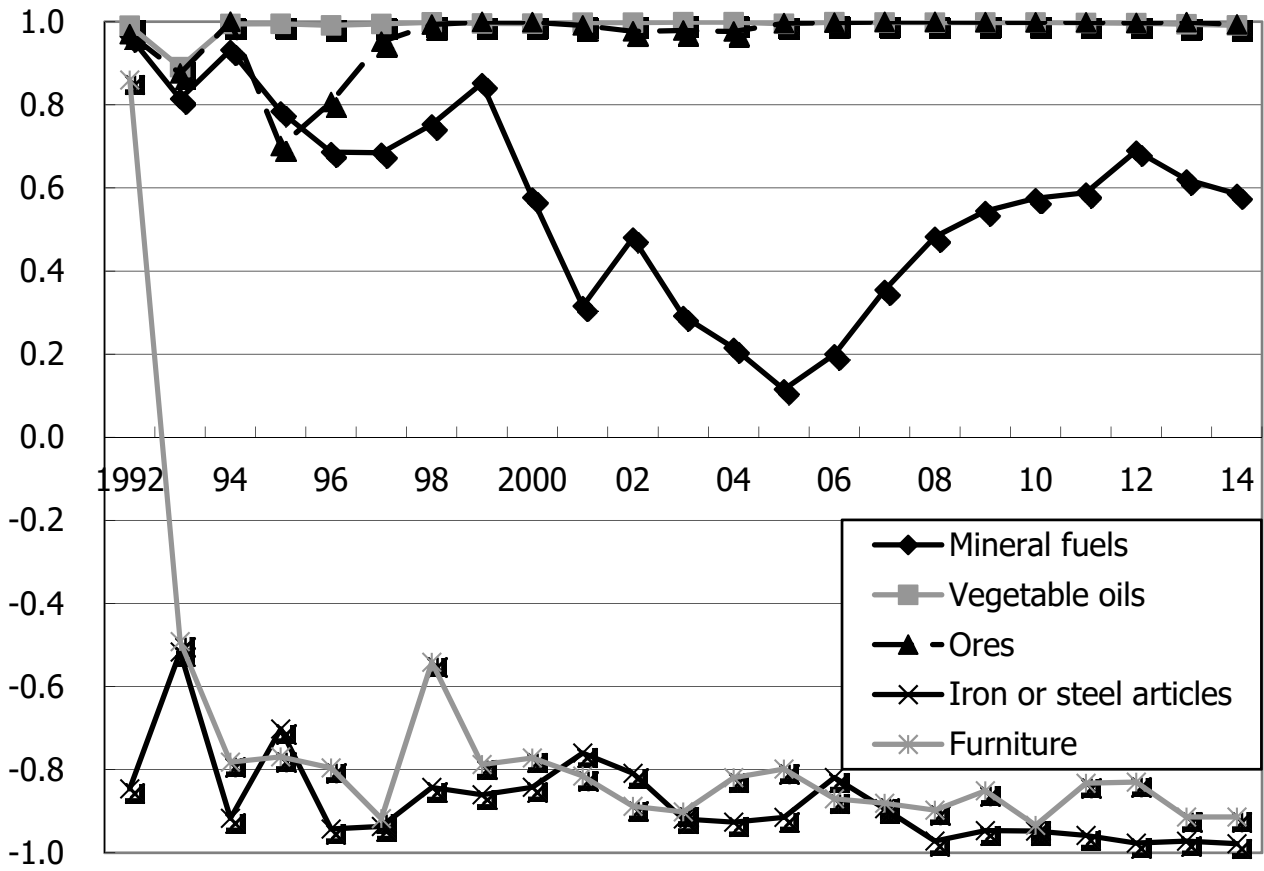
Figure 8.18a TSC of perpetuated specification subsectors in Indonesia

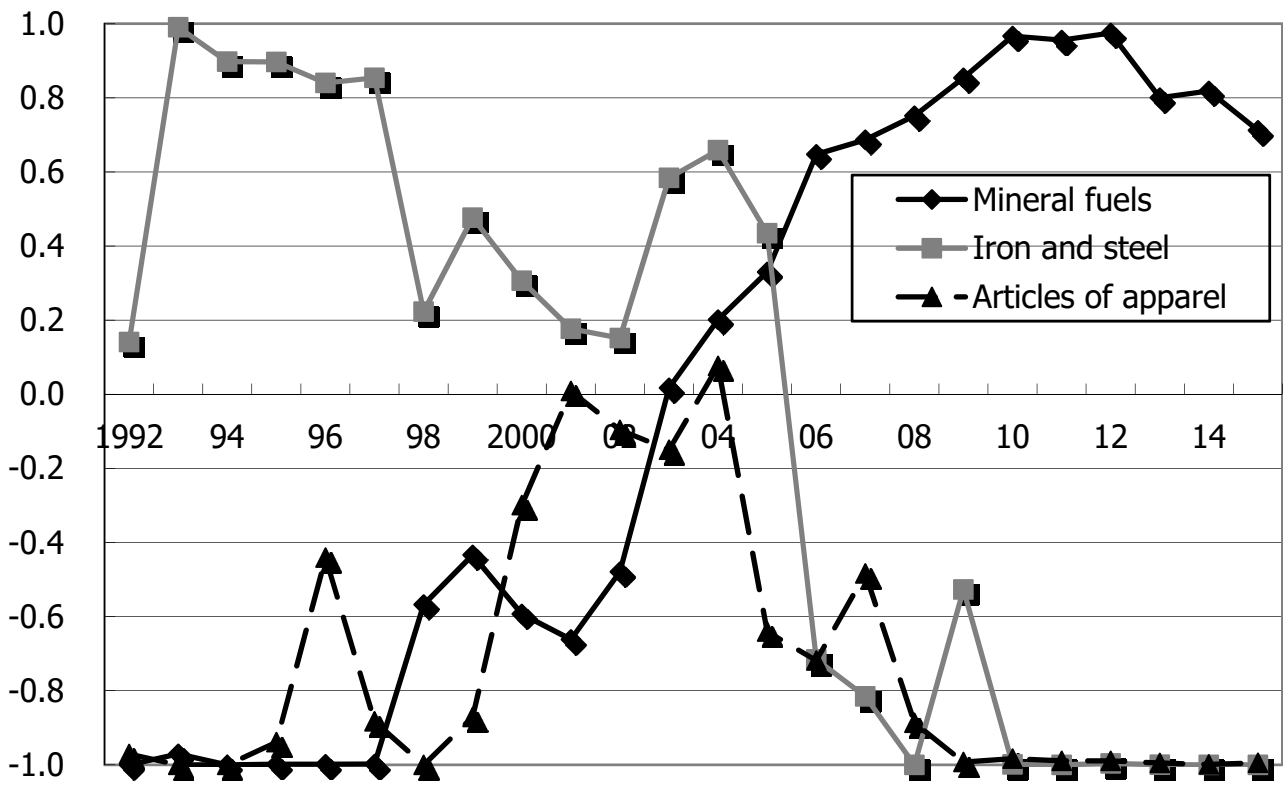Source: Author calculation based on UN ComTrade database.

Figure 8.18b TSC in changing specialization sectors in Indonesia

Source: Author calculation based on UN ComTrade database.

Figure 8.18c Relative comparative advantage (RCA) of Indonesian top ten traded goods

Source: Author calculation based on UN ComTrade database.

Figure 8.19a TSC of perpetuated specification subsectors in Mongolia

Source: Author calculation based on UN ComTrade database.

Figure 8.19b TSC in changing specialization sectors in Mongolia

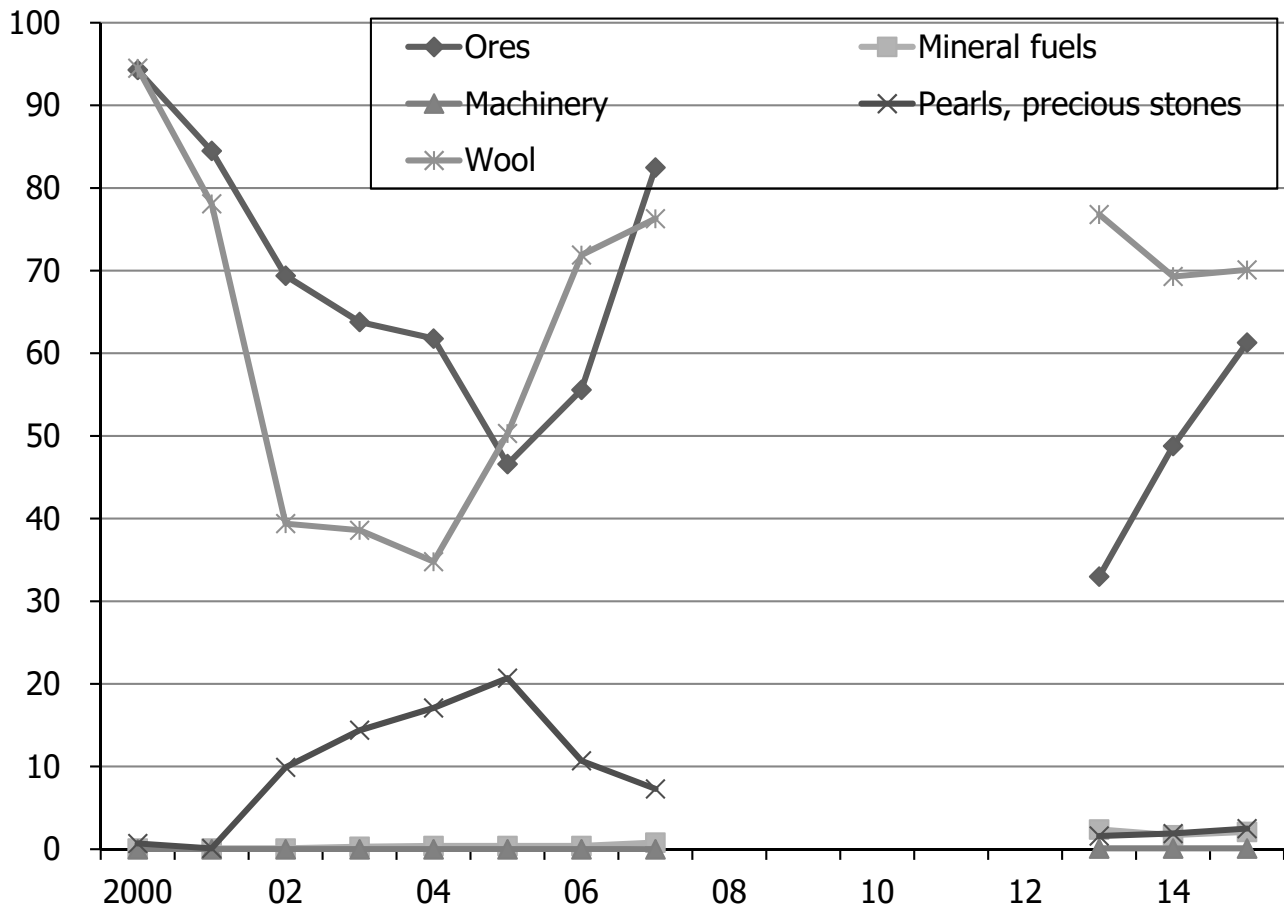Source: Author calculation based on UN ComTrade database.

Figure 8.19c RCA of Mongolian top seven traded goods

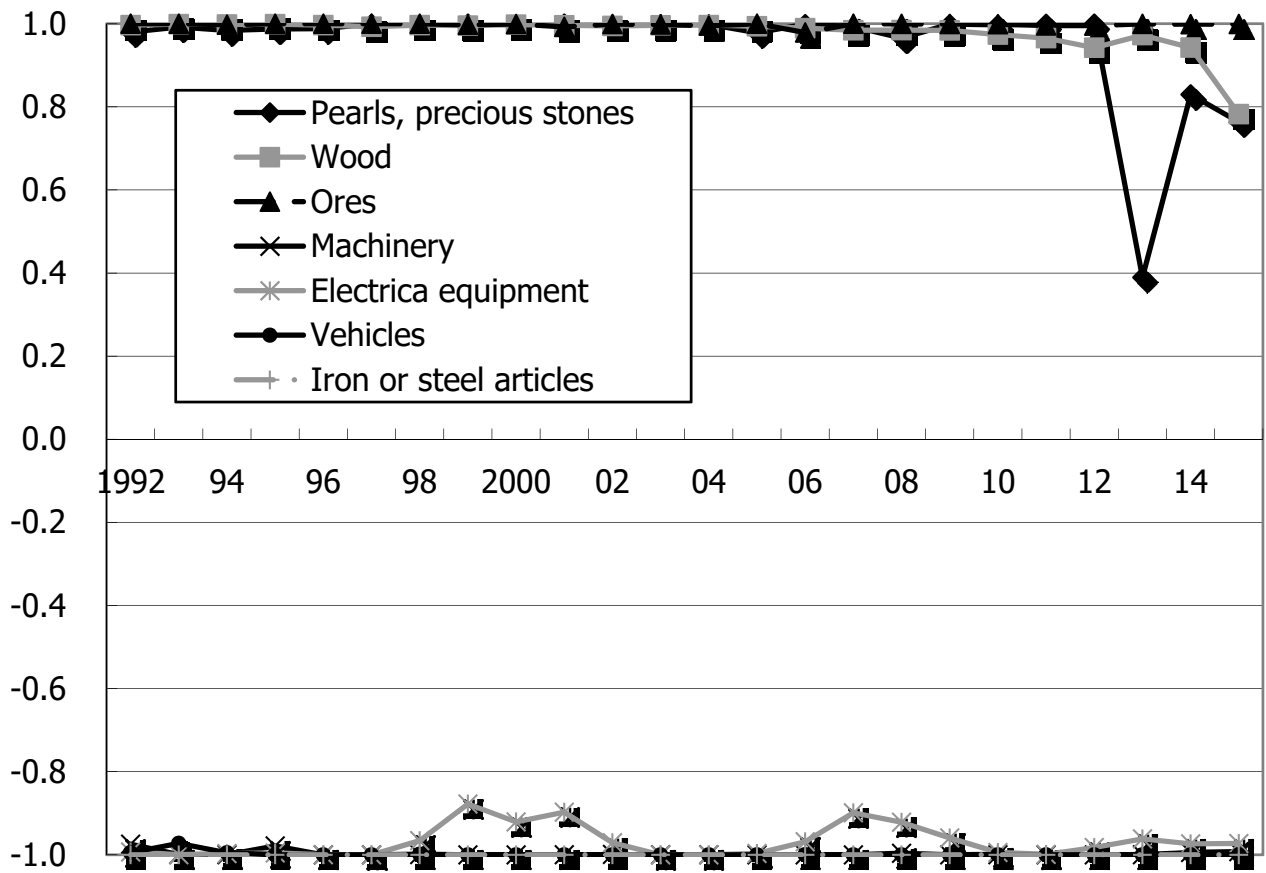Source: Author compilation based on UN ComTrade database.

Figure 8.20a TSC of perpetuated specification subsectors in Myanmar

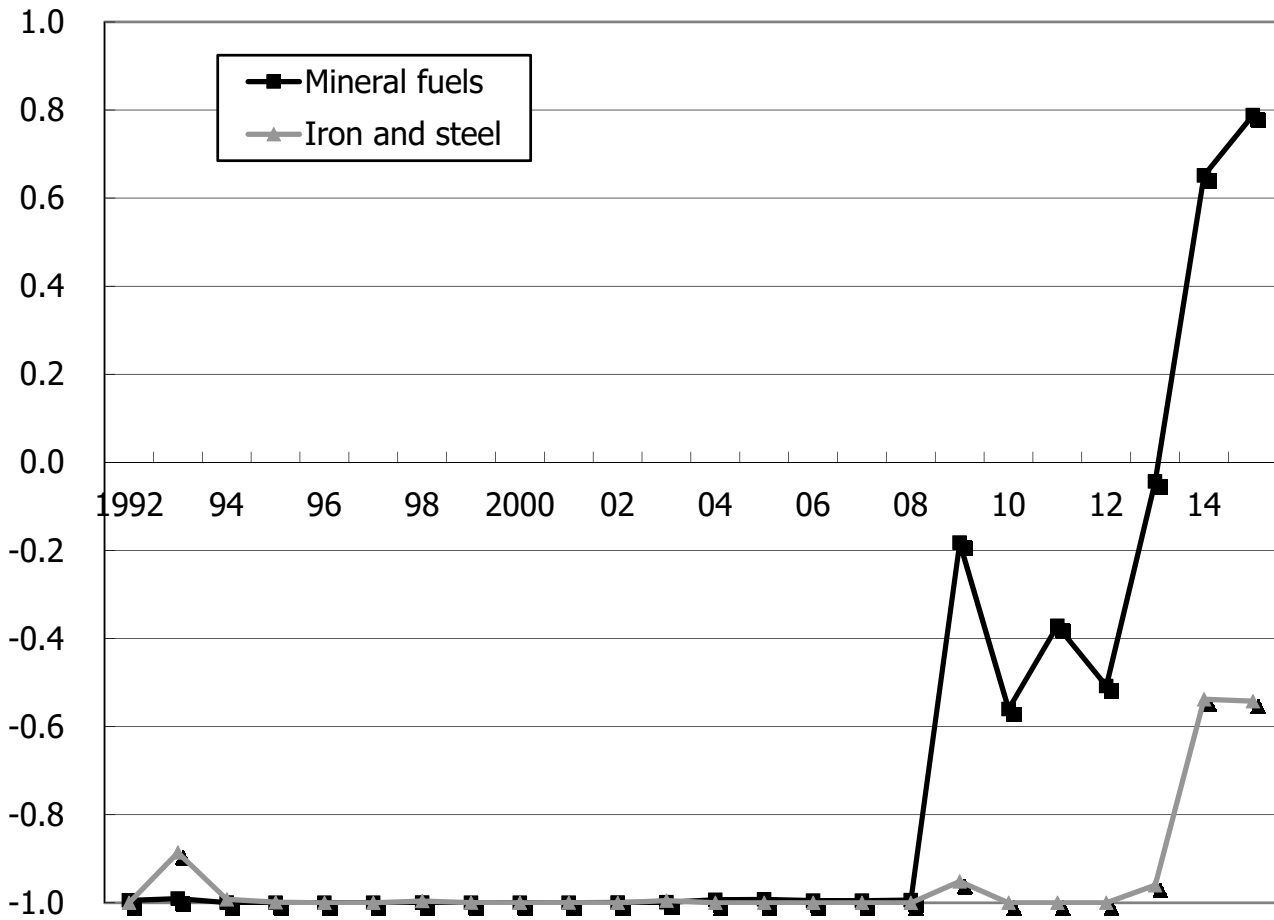Source: Author calculation based on UN ComTrade database.

Figure 8.20b TSC change in specification in Myanmar

Source: Author calculation based on UN ComTrade Database.
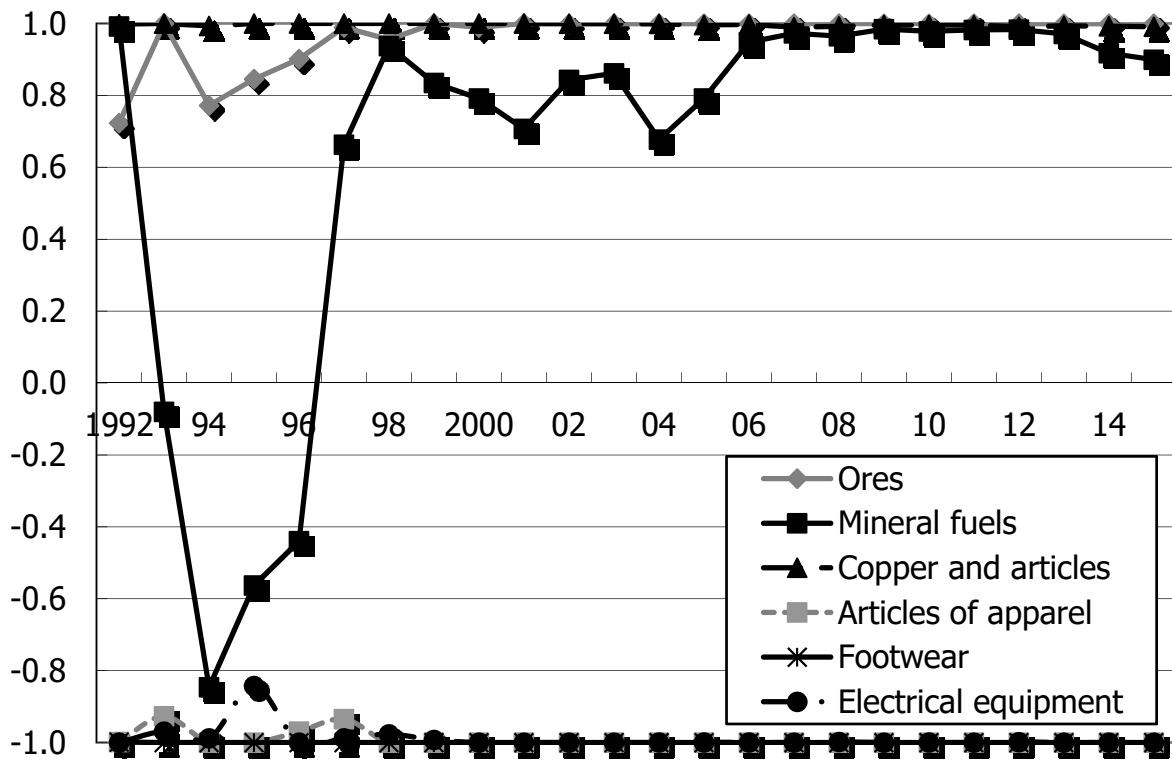
Figure 8.21a TSC of perpetuated specification subsectors in Kazakhstan

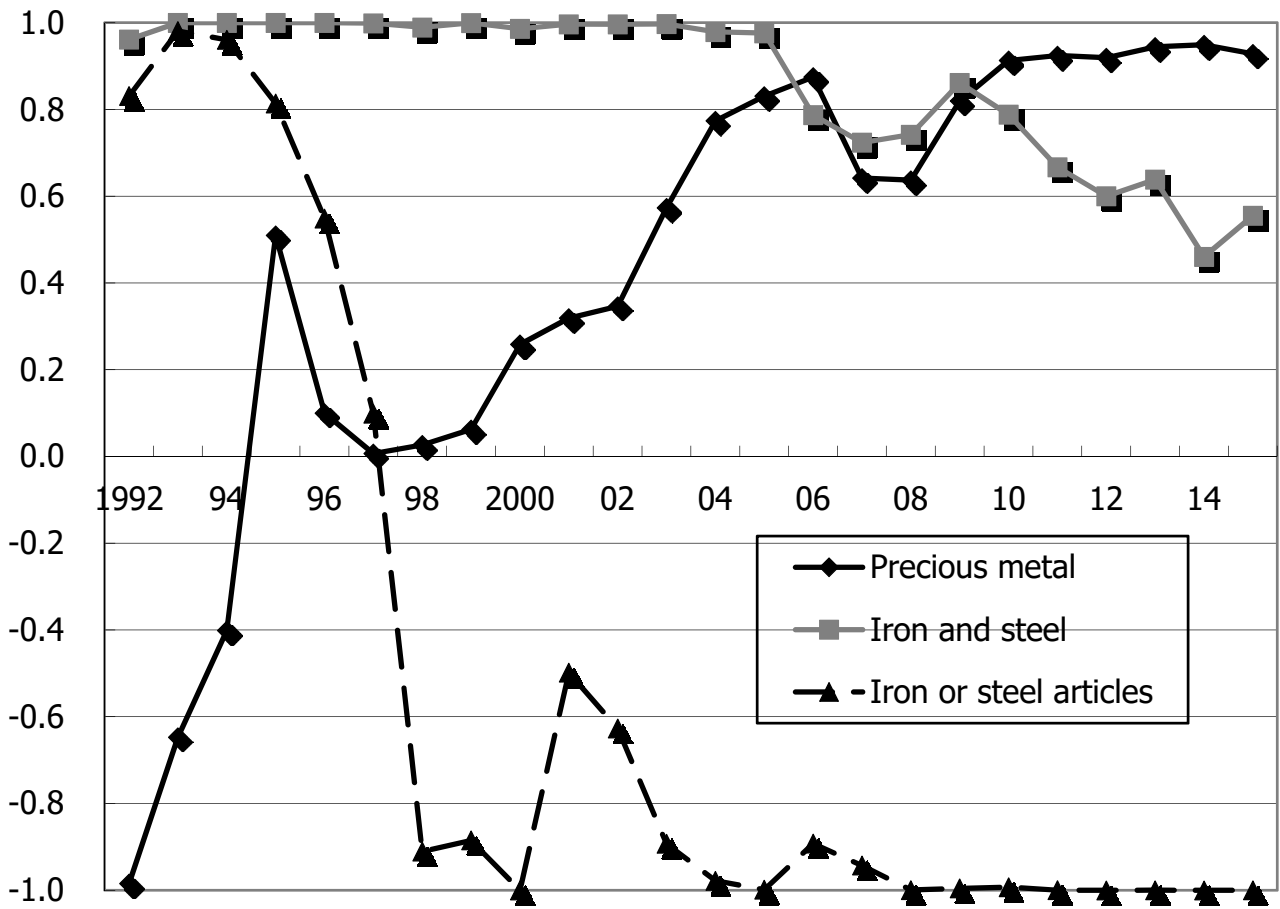Source: Author calculation based on UN ComTrade database.

Figure 8.21b TSC in changing specification in Kazakhstan

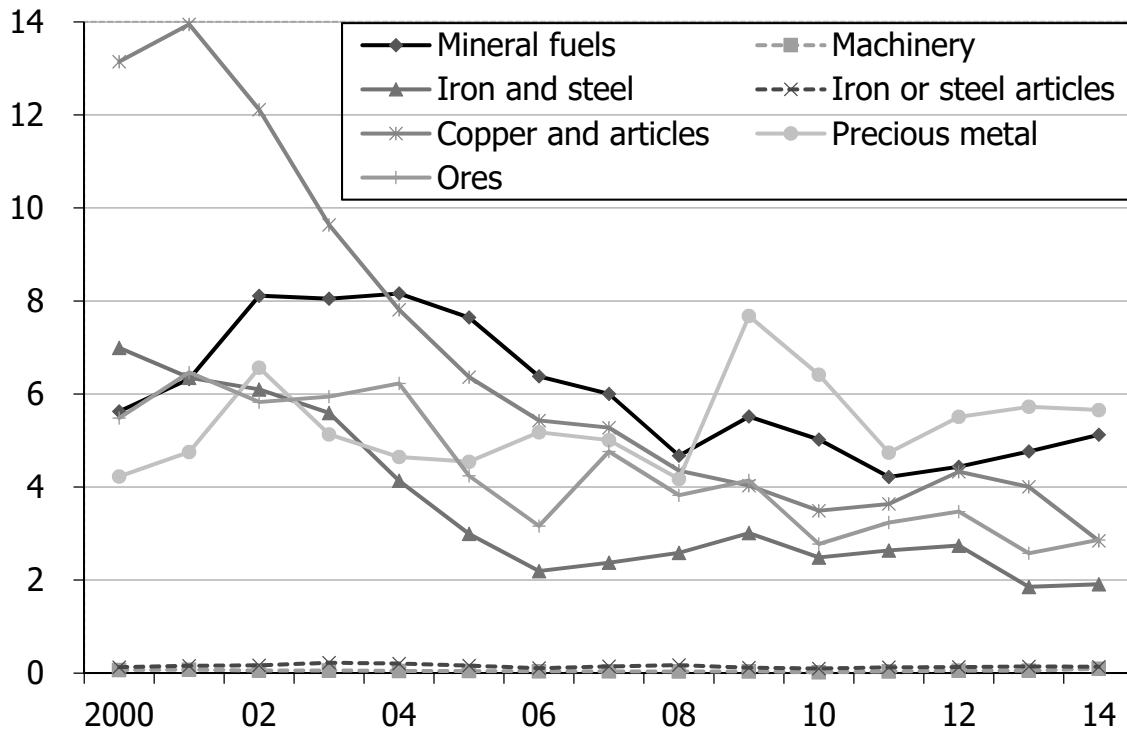Source: Author calculation based on UN ComTrade database.

Figure 8.21c RCA of top ten traded goods in Kazakhstan

Source: Author calculation based on UN ComTrade database.

Figure 8.22a TSC of perpetuated specification subsectors in Turkmenistan

Source: Author calculation based on UN ComTrade database.
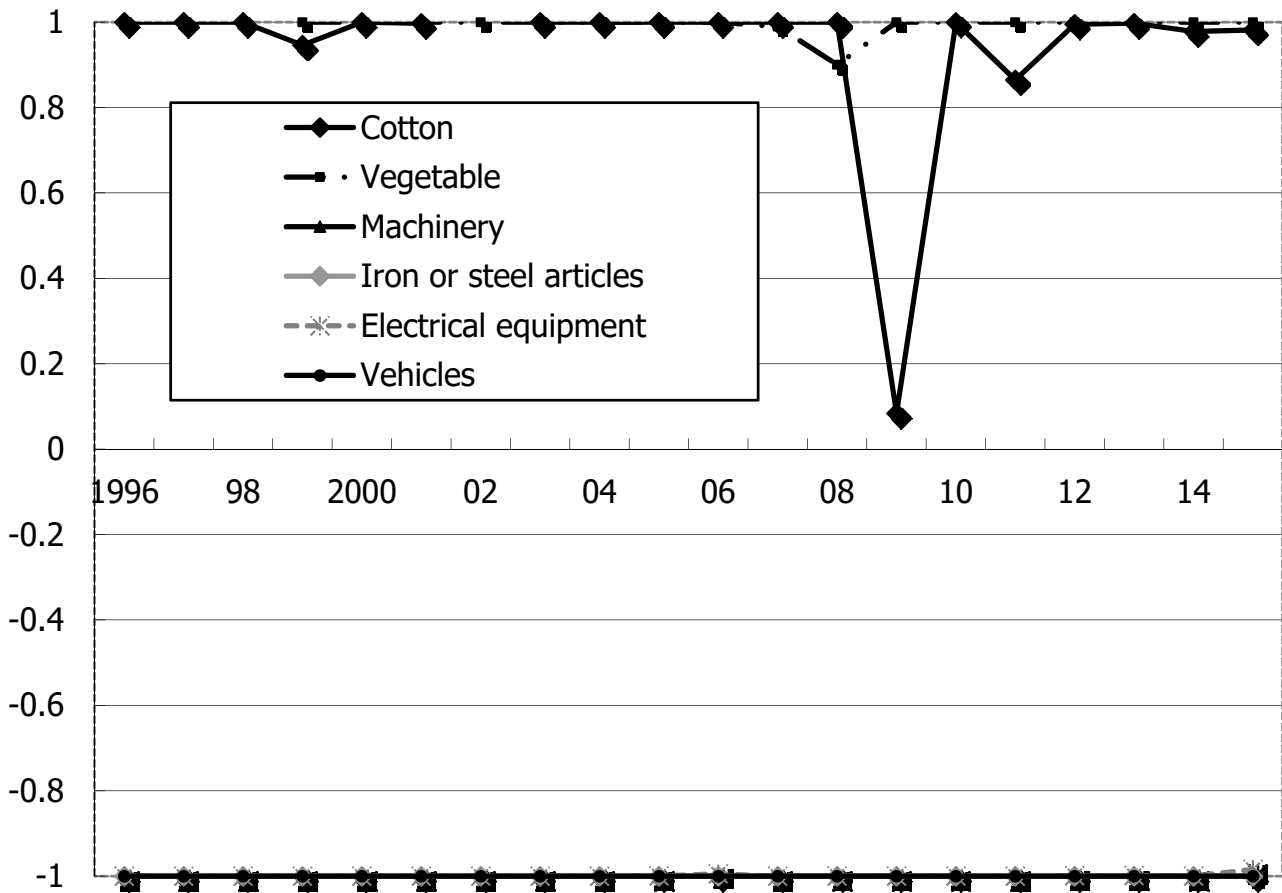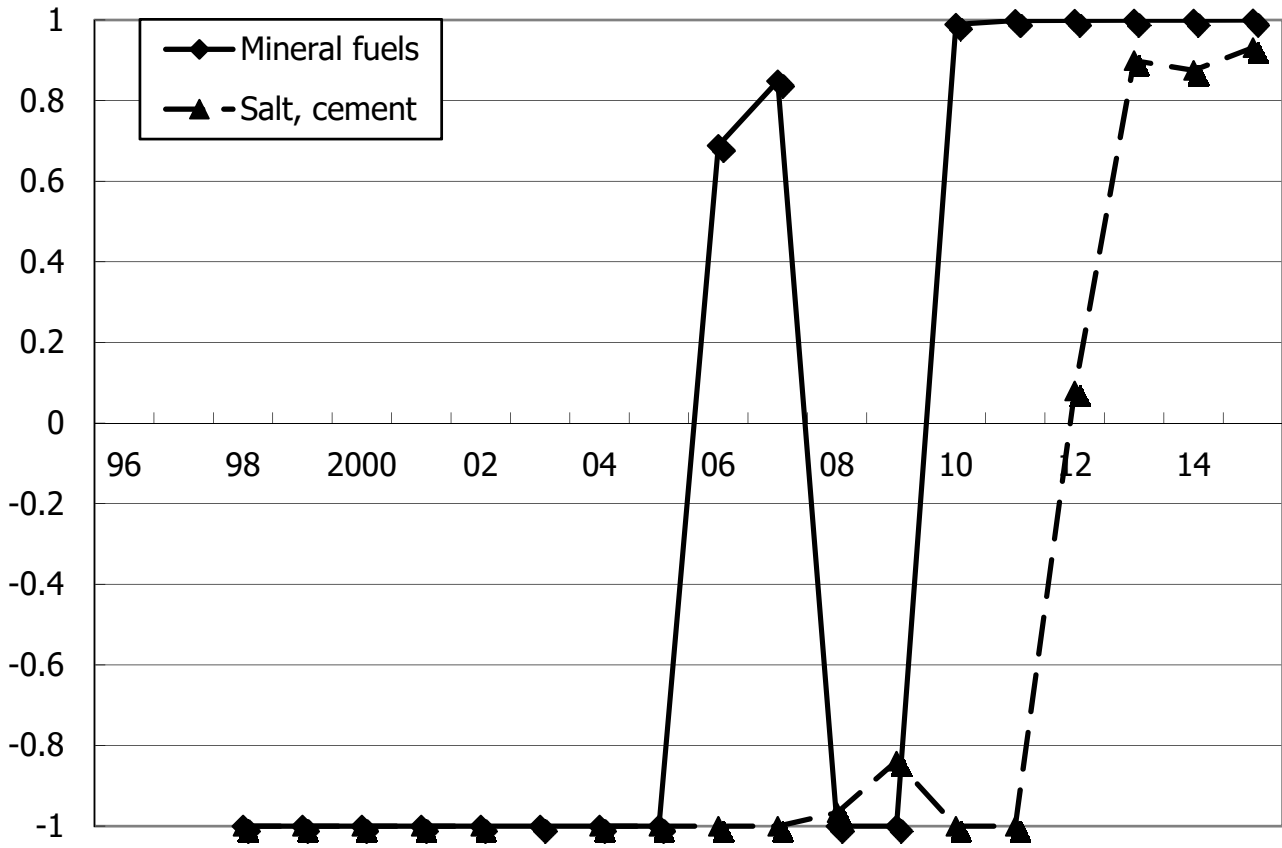
Figure 8.22b TSC in changing specification in Turkmenistan

Source: Author calculation based on UN ComTrade database.
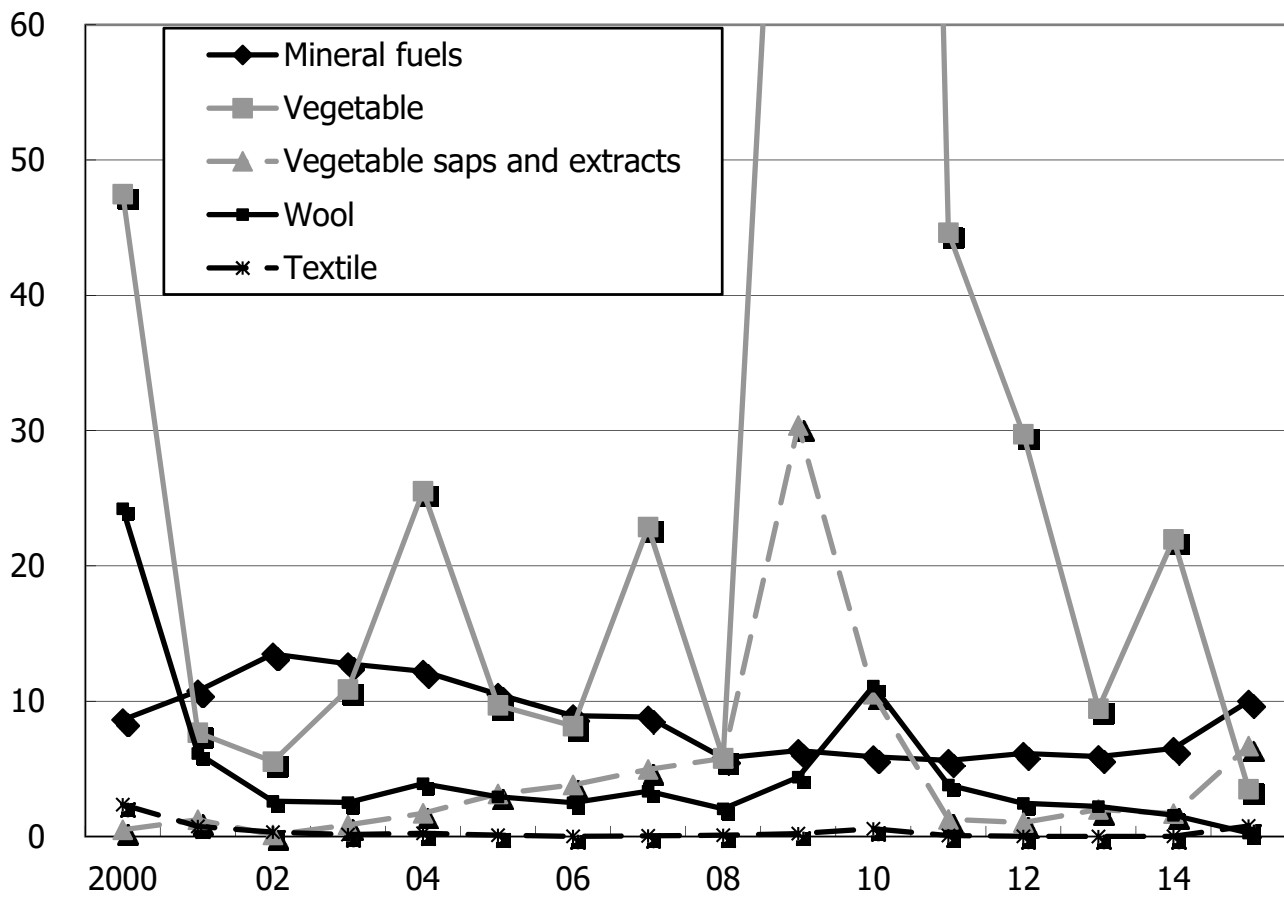
Figure 8.22c RCA of top five export goods in Turkmenistan

Note: Export of Turkmenistan is the sum of its export to China, EU, Ukraine, Russia and Kazakhstan, which accounts for 98 percent in 2001, 2004, 2009 and 2015.

Source: Author calculation based on UN ComTrade database.
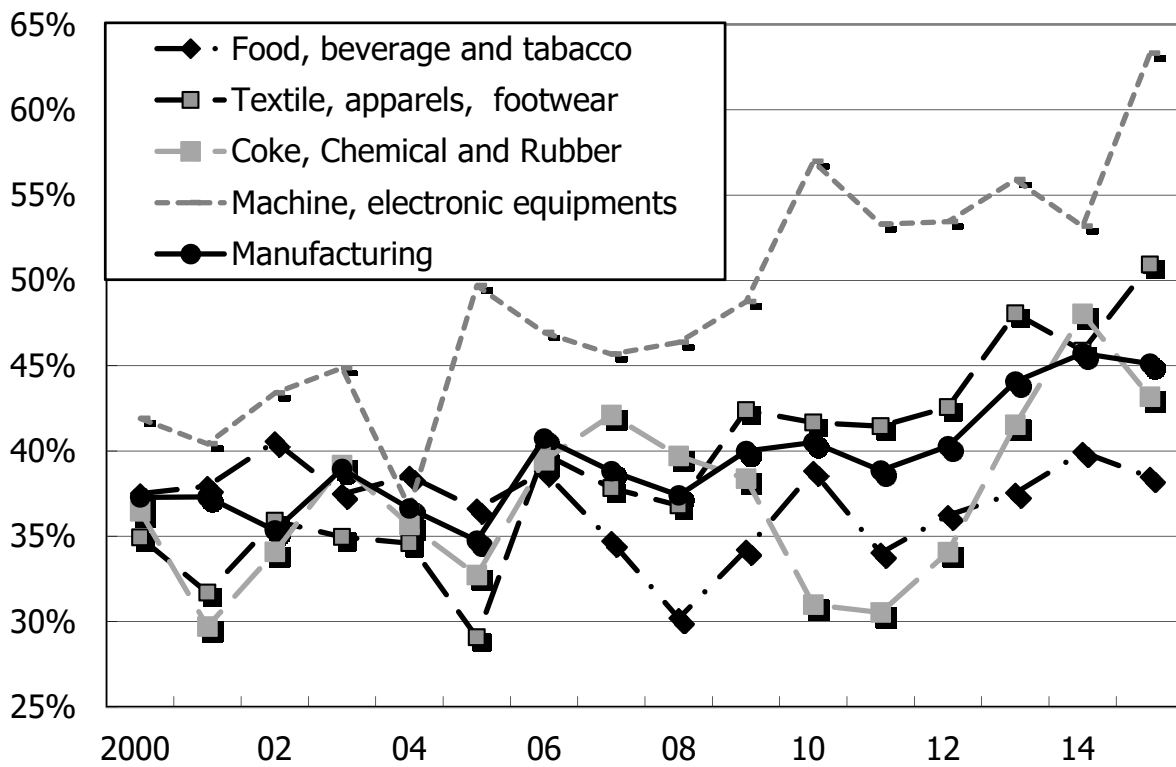
Figure 8.23 Manufacturing value added in the output value in Indonesia

Source: Author compiled based on *Statistik Indonesia*, each year.
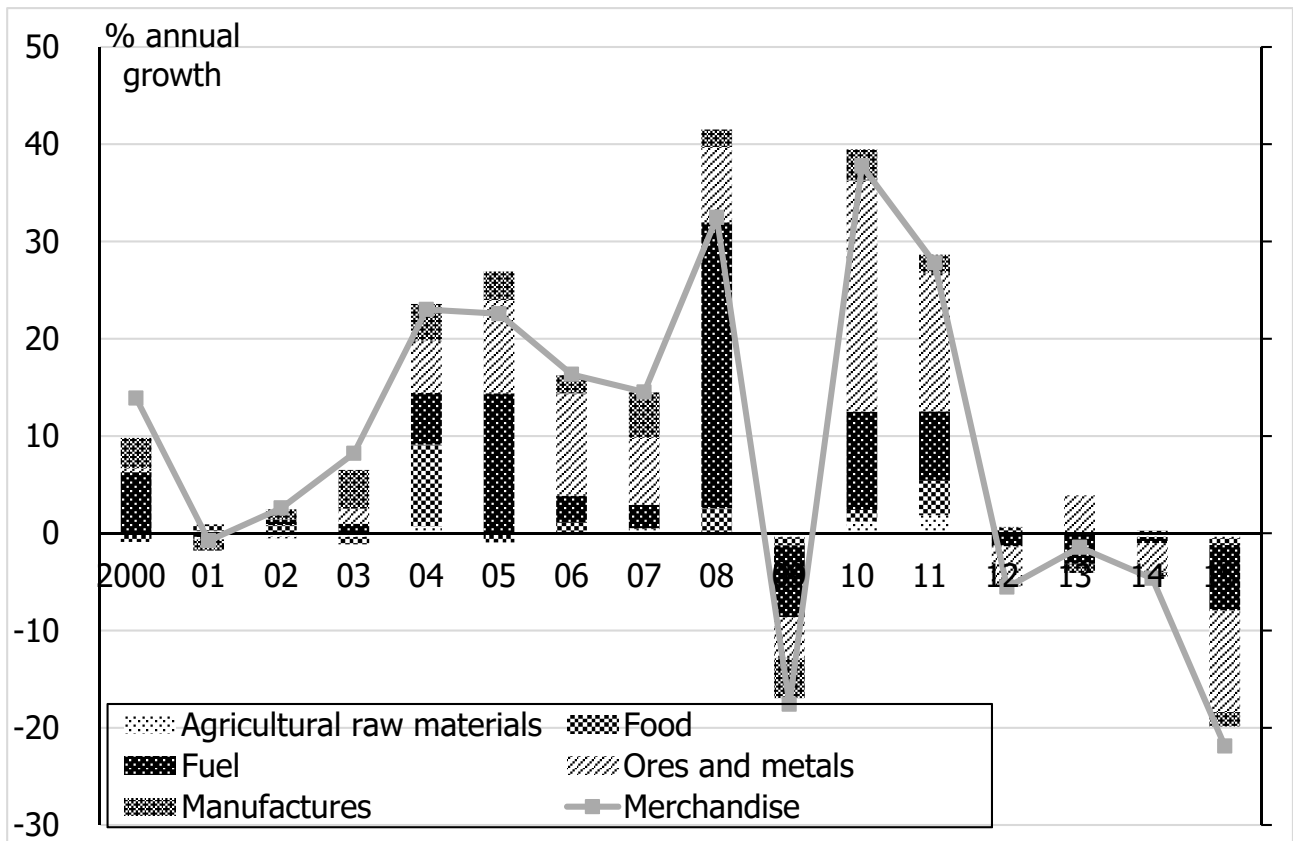
Figure 8.24a Composition of annual export growth in Australia

Source: Author calculation based on World Bank (2017).
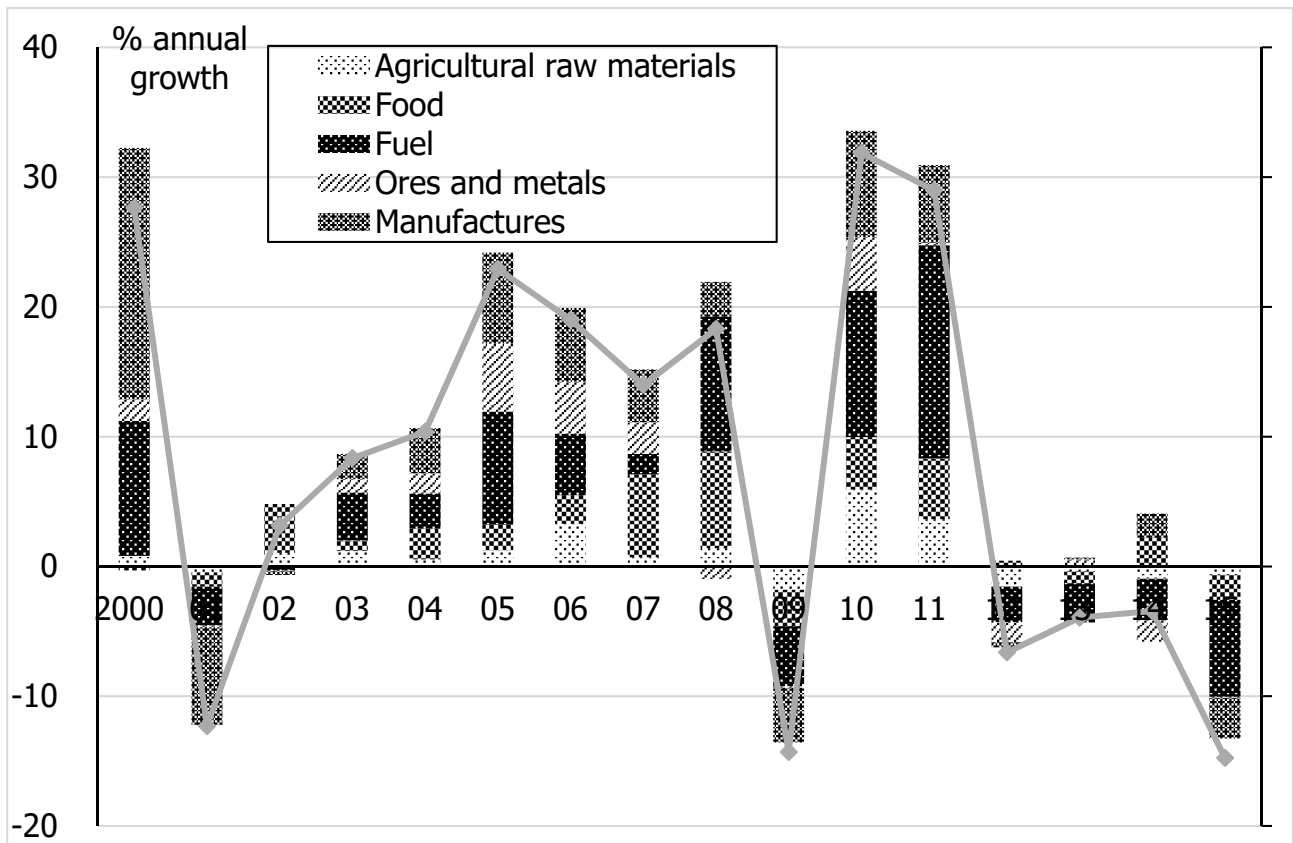
Figure 8.24b Composition of annual export growth in Indonesia

Source: Author calculation based on World Bank (2017).

Figure 8.24c Composition of annual export growth in Kazakhstan

Source: Author calculation based on World Bank (2017).

Figure 8.24d Composition of annual export growth in Mongolia

Source: Author calculation based on World Bank (2017).

Table 8.1 Specification of export structure in the six countries

Australia

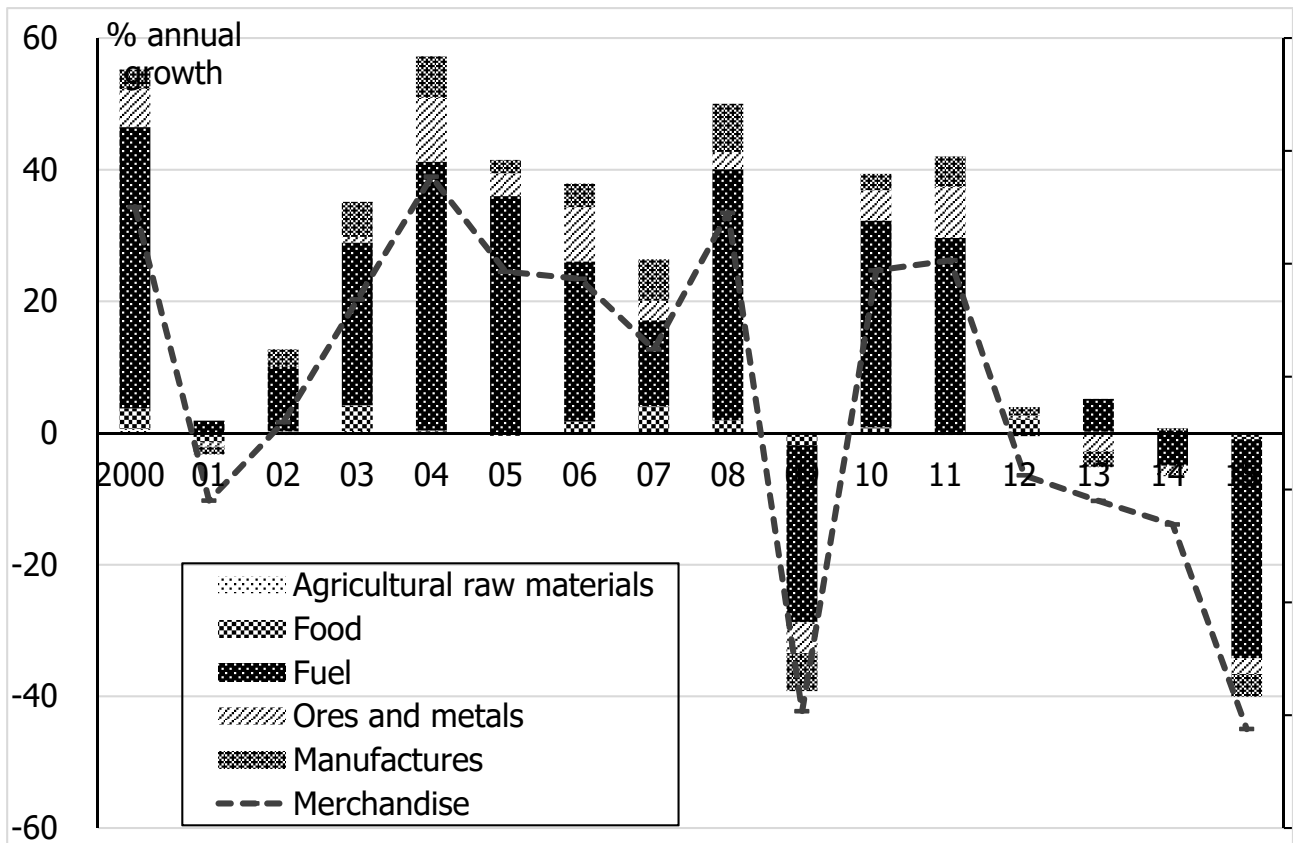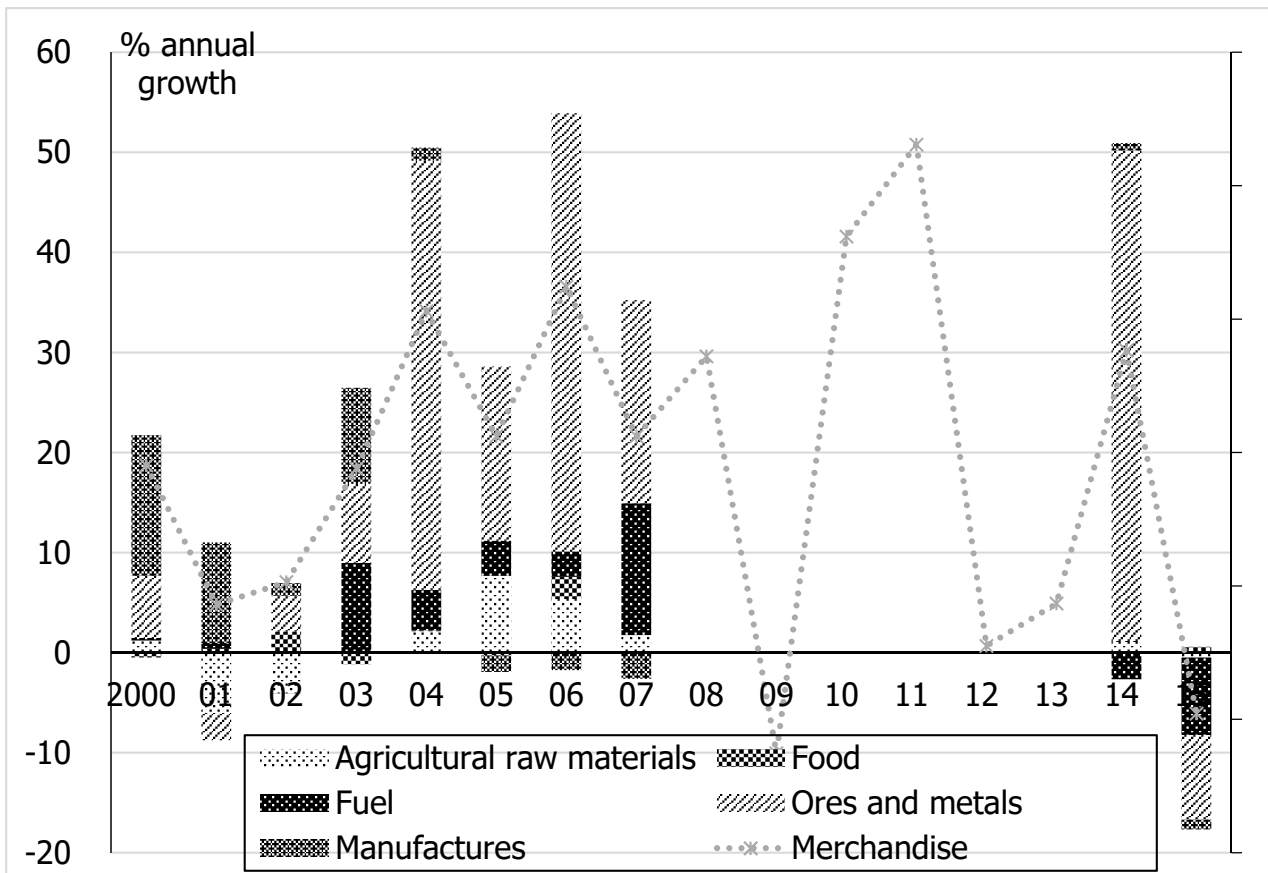| 1996		2001		2004		2009		2014	
Mineral fuels	0.17	Mineral fuels	0.21	Mineral fuels	0.20	Mineral fuels	0.30	Ores	0.31
Pearls, precious stones	0.08	Ores	0.08	Ores	0.10	Ores	0.20	Mineral fuels	0.27
Ores	0.07	Meat	0.05	Meat	0.05	Pearls, precious stones	0.08	Pearls, precious stones	0.06
Cereals	0.07	Pearls, precious stones	0.05	Pearls, precious stones	0.05	Meat	0.03	Meat	0.04
Machinery	0.06	Cereals	0.05	Cereals	0.05	Cereals	0.03	Cereals	0.03
Sum	0.45		0.44		0.46		0.64		0.70
UNCTAD's export concentration index	0.16		0.18		0.19		0.31		0.35

Indonesia

1996		2001		2004		2009		2014	
Mineral fuels	0.26	Mineral fuels	0.25	Mineral fuels	0.26	Mineral fuels	0.28	Mineral fuels	0.29
Wood	0.10	Electrical equipment	0.11	Electrical equipment	0.09	Vegetable oils	0.10	Vegetable oils	0.12
Electrical equipment	0.07	Wood	0.06	Vegetable oils	0.06	Electrical equipment	0.07	Electrical equipment	0.06
Apparel	0.05	Apparel	0.05	Machinery	0.05	Ores	0.05	Rubber	0.04
Rubber	0.05	Machinery	0.05	Wood	0.05	Rubber	0.04	Machinery	0.03
Sum	0.52		0.52		0.51		0.55		0.54
UNCTAD's export concentration index	0.23		0.23		0.23		0.25		0.26

Mongolia

1996		2001		2004		2009		2014	
Ores	0.52	Ores	0.34	Ores	0.36	N.A.	N.A.	Ores	0.56
Wool	0.18	Apparel	0.23	Gold	0.27	N.A.	N.A.	Mineral fuels	0.26
Fluorine minerals	0.05	Wool	0.15	Apparel	0.16	N.A.	N.A.	Gold	0.07
Apparel	0.06	Leather	0.13	Wool	0.06	N.A.	N.A.	Wool	0.05
Leather	0.05	Fluorine minerals	0.05	Mineral fuels	0.03	N.A.	N.A.	Fluorine minerals	0.01
Sum	0.87		0.89		0.88		N.A.		0.95
UNCTAD's export concentration index	0.51		0.37		0.41		N.A.		0.58

Myanmar

1992		2001		2004		2010		2014	
Wood	0.33	N.A.	N.A.	N.A.	N.A.	Mineral fuels	0.39	N.A.	N.A.
Vegetables	0.24	N.A.	N.A.	N.A.	N.A.	Pearls, precious stones	0.25	N.A.	N.A.
Cereals	0.10	N.A.	N.A.	N.A.	N.A.	Vegetables	0.12	N.A.	N.A.
Fish	0.08	N.A.	N.A.	N.A.	N.A.	Wood	0.08	N.A.	N.A.
Seed, fruit	0.07	N.A.	N.A.	N.A.	N.A.	Apparel	0.04	N.A.	N.A.
Sum	0.81						0.87		
UNCTAD's export concentration index	0.37		N.A.		N.A.		0.42		N.A.

Kazakhstan

1996		2001		2004		2009		2014	
Mineral fuels	0.33	Mineral fuels	0.56	Mineral fuels	0.64	Mineral fuels	0.70	Mineral fuels	0.76
Iron and steel	0.15	Iron and steel	0.12	Iron and steel	0.11	Iron and steel	0.07	Iron and steel	0.04
Copper	0.10	Copper	0.08	Copper	0.06	Precious metal	0.05	Precious metal	0.04
Cereals	0.07	Cereals	0.04	Ores	0.04	Ores	0.04	Ores	0.03
Precious metal	0.07	Precious metal	0.03	Precious metal	0.03	Copper	0.04	Copper	0.02
Sum	0.72		0.84		0.88		0.89		0.90
UNCTAD's export concentration index	0.33		0.54		0.62		0.67		0.74

Turkmenistan

1997		2001		2004		2009		2014	
Mineral fuels	0.77	Mineral fuels	0.97	Mineral fuels	0.96	Mineral fuels	0.80	Mineral fuels	0.97
Cotton	0.16	Cotton	0.01	Cotton	0.02	Cotton	0.02	Cement and Salt	0.01
Cement and Salt	0.01	Fabrics	0.00	Textile	0.00	Plastics	0.01	Plastics	0.00
Leather	0.01	Wool	0.00	Carpets	0.00	Vegetable	0.01	Cotton	0.00
Fabric	0.01	Apparel	0.00	Apparel	0.00	Apparel	0.01	Textile	0.00
Sum	0.95		0.99		0.99		0.85		0.99
UNCTAD's export concentration index	0.76		0.95		0.96		0.79		0.94

Note: Export of Turkmenistan is the sum of its export to China, EU, Ukraine, Russia and Kazakhstan, which accounts for 98 percent in 2001, 2004, 2009 and 2015.

Source: Author compilation based on UN ComTrade.