Economic Geography of the Australian Mining Industry

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ECONOMIC GEOGRAPHY OF THE AUSTRALIAN MINING INDUSTRY

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ABSTRACT

This paper is a discussion of the economic geography of Australia. It provides a history of foreign investment in mining, and discusses several resources booms that shaped the landscape of the continent and the role of governments (state, federal and territory governments) in this process. The paper presents a chronological account of the development of the Australian mining industry, the primary activities of which are the extraction, and export of unprocessed coal, iron, minerals and increasingly natural gas. The paper analyzes the industry's interaction with foreign investment and government assistance (that is government spending in relation to the industry such as subsidies, loans and infrastructure construction etc). Australia's trade and foreign investment environment have long been deregulated. The Australian mining industry has benefited from this deregulation. But its most spectacular period has been the "commodities super-cycle" of the 2000s-2010s. Overall, its contribution to exports has long typified the mining industry. The discussion herein draws attention to the applicability of the 'eclectic theory' in reference to foreign investment in mining. That is, investing mining MNEs (multinational enterprises) have three main types of 'locational advantages' in Australia, 1) volume of the availability of resources, 2) foreign investment regulatory environment and 3) government assistance that benefits the mining industry's expansion.

Keywords: Australia, economic geography, mining, FDI, government, neoliberalism

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INTRODUCTION

This is an account of a resources exports based economic geography in the Southern hemisphere, Australia. The Australian mining industry, its entire infrastructure, urban and regional development dichotomy, domestic market, governance, and its international trade and investment relations are chiefly built on finite volumes of resources exports. Thus, the present economic geography depends on specific proven volumes. Minerals, coal, natural gas, and crude oil (up until the last decade) have defined the boundaries of the Australian economy, after an initial emphasis on other land-based economies of agriculture, grazing, and some limited activities in marine industries as far south as Tasmania and Torres Strait in the north. Following the British colonization, coal was mined in Australia as early as 1797 for local consumption and local iron production began in 1852 (Campbell 2009, p. 2, Southern 1987, p. 28). The Australian mining industry became internationalized with the 1850s-1870s' gold rush and then the 1880s-1890s' boom in gold and tin (Fahey 2010, Markus 2010). These booms attracted prospectors, and investment from the Americas, Europe, and China, in addition to government-regulated migration from the UK and its imperial territories. The Australian economic and social geography rapidly became shaped by demand from overseas. Soon demand for other newly discovered mineral resources followed. By the final decades of the 19th century

significant extractive industries had emerged. Table 1 provides a timeline of this process.

Table 1: Timeline of booms

TIME PERIOD	DISCOVERIES AND BOOMS
1850s	Extensive coal mining for ironworks begins
1850-1870s	Gold is discovered and there is a two-decade long boom
1880-1890s	Tin, gold, copper, silver, lead, zinc and iron industries grow
1950s	Extensive lead, zinc and copper discoveries are made
1960s-1970s' boom	Coal, iron ore, bauxite and oil industries boom
1970s-1980s' boom	Coal seam gas, oil, liquefied natural gas, and aluminum industries boom
2000s-2010s' boom	Commodities super cycle - the longest boom ever

Source: Battellino 2010, Bramble & Kuhn 2011

Resources: Mineral and energy deposits are present in diverse locations across the continent of 7,692,024 square kilometers, and Western Australia accounts for almost all the national iron, tantalum and nickel output, and is also the leading gold, diamond, zircon and petroleum producer (Geoscience Australia 2015). Table 2 displays the locations of resources across Queensland (QLD), Western Australia (WA), Northern Territory (NT), New South Wales (NSW), Victoria (VIC), South Australia (SA), and Tasmania (TAS). Western Australia constitutes the great bulk of Australian resource capitalism and, in particular, is characterized by its Pilbara region. This region is the centre of the iron ore extraction in Australia. It has experienced an economic geographical transformation under the intensification of resource capitalism following the neoliberal deregulation of resources trade and foreign investment in the mining industry (Holcombe 2010). This region of Australia provides an example of land "commodification" with two separate periods, first with the British colonization of the continent and second with the mining booms after World War II (Peck 2013a). To be sure, in the vast continent, the development of many towns and regional centers was the result of investment by mining MNEs (McKay et al. 2000, Altman 2012).

Table 2: Australian resources and locations

RESOURCES	LOCATIONS
Bauxite	QLD, WA, NT
Black Coal (thermal, metallurgical)	QLD, NSW
Brown Coal	VIC
Coal seam gas	QLD, NSW
Copper	SA, NSW, QLD
Diamond	WA
Gold	WA, TAS, VIC, NT, QLD, SA
Iron ore	WA
Lead	QLD, NT
Liquefied natural gas	WA, NT
Lithium	WA
Magnesite	SA, QLD
Nickel	WA
Oil shale	QLD
Petroleum	WA
Phosphate	QLD, NT
Rare earth oxides	WA
Silver	QLD, NT, NSW
Tantalum	WA, NSW
Tin	TAS
Tungsten	WA
Vanadium	WA
Zinc	QLD, NT

Source: APPEA 2015, Geoscience Australia 2015, Spedding 2015

MNE profiles: The UK MNEs drove the Australian mining industry until 1945, mainly due to the existence of Pax Britannica and its colonial economic networks. The two largest mining MNEs in the world are still Anglo Australian corporations, BHP Billiton and Rio Tinto. However, their Australian ownership levels are low. In the case of BHP Billiton, foreigners own 76 percent of the shares, and for Rio Tinto the figure is 83 percent, while what is considered to be an Australian MNEs, Fortescue and Minara are 40 and 82 percent foreign owned, respectively (Edwards 2011, p. 1-4). This highlights the importance of foreign capital in this industry, where the insufficiency of local capital does not hinder exploration, extraction and exports of energy and mineral resources.

Table 3: Mining MNEs in Australia

MNE	REGISTRY	WORLD RANKING
BHP Billiton	the UK and Australia	1
Rio Tinto	the UK and Australia	2
Glencore	the UK and Switzerland	5
Anglo American	the UK	7
Fortescue	Australia	8
Barrick	Canada	14
Newcrest	Australia	18
Newmont	the US	27
Alcoa	the US	outside the global top 40
Peabody	the US	outside the global top 40
Minara	Australia	outside the global top 40

Source: PricewaterhouseCoopers 2015

From 1945 onwards, the US MNEs entered the mining industry alongside their investments in the manufacturing sector, and the US MNEs were followed by the entry of the Japanese MNEs from the early 1960s onwards (Bayari 2012a). The entry of the Chinese and Indian MNEs in the 2010s has thus far chiefly targeted coal mining (Betigeri 2015, Borrello 2015, Validakis 2015). There are two primary continuities in the economic history of mining in Australia, new resource discoveries, and new investors. BHP Billiton (the world's largest mining MNE), Rio Tinto (the second largest in the world) and Glencore (the fourth largest) are the biggest investors in the Australian mining industry. Other major foreign MNEs that invest in the Australian mining industry include Anglo American (thermal and metallurgical coal), Fortescue (iron ore), Peabody (thermal and metallurgical coal), Barrick (gold), Newmont (gold), Newcrest (gold), and Minara (nickel). Alcoa is the largest investor in the Australian aluminum industry. These ten MNEs take up the first five ranks among all the companies that mine coal, iron ore, aluminum, copper, gold and nickel in Australia (Edwards 2011, p. 4). Table 3 lists them by their registry location, and world ranking. In the Australian mining industry, Japanese MNEs operate in joint ventures, frequently with BHP Billiton, to receive a share of the extracted resources mainly for their home market. There are several Japanese energy MNEs in the Australian mining industry. Idemitsu and Chugoku Electric Power (Central Japan electricity production and supply company) have had their own thermal coalmines in Australia for the past several decades. Itochu, another Japanese MNE, which is a predominantly goods, commodities and services trading company, has been in the Australian thermal coal industry since the 1960s. Mitsui and Co. Ltd. is Australia's fifth largest crude oil producer, and also invests in gas and thermal coal production. The company has iron ore joint ventures with Itochu, and BHP Billiton. Itochu is also a party to BHP Billiton's alumina joint ventures with other Japanese MNEs Nissho

Iwai, Sojitsu and Kobe Steel. Mitsui and Co. Ltd and Itochu, alongside BHP Billiton are partners in iron ore joint ventures with China's Wuhan Iron and Steel, Maanshan Iron and Steel, Jiangsu Shagang Group and Tangshan Iron and Steel. Many of the extraction, processing and the related equipment patents the Australian mining industry had prosecuted, by 2013, were filed by foreign mining MNEs, including Glencore, Alcoa, BHP Billiton and Rio Tinto (the largest inventing and patent filing foreign MNE in Australia), and foreign manufacturing MNEs such as Mitsui Matsushima, Hitachi, and Komatsu (Francis 2015, p. 14, 17, 26, 28). This state of affairs is a reflection of foreign investment levels in the Australian mining industry. Nations possess distinct and peculiar economic geographies but also some common characteristics (Narula & Dunning 2010, p. 265, 281). The Australian economy, like some of the other nations of the global south economic geography, has come to depend on export of minerals, coal, and gas to maintain its viability (Leaver 2011, Wise & Covarrubias 2012). On the whole, there is a definite timeline for the present extraction rates of the mining resources in Australia. In the next several decades, it will not be possible to maintain the current export volumes of iron, coal, bauxite, copper, and other resources, unless new discoveries are made (Edwards 2011, p. 3, 18, Ingram 2015). New discoveries require new investment and infrastructure construction. Overall, resources that have been utilized in the construction of the present economic geography of Australia also define its future.

ECONOMIC CONTRIBUTION

The significance of Australia's mining industry can be deduced from the following figures. Australia's GDP is worth approximately A$1.5 trillion, and the mining industry forms 9 percent of GDP, which is currently larger than the contributions of agriculture (2.5 percent) and manufacturing (6.8 percent) sectors (ABS 5204.0 2015). This discussion does not cover it but there is a complex economic interrelationship between industries. That is, if the size of mining industry had been smaller, industries that interact with it, such as construction, electricity, natural gas and water, would also have smaller shares of GDP. Some sections of the manufacturing industry output also depend on resource extraction volumes, rates and price. Australia has the largest 'proven gas reserves' and the second largest 'proven coal reserves' in the Asia Pacific region, where the great majority of its export markets are located (BP 2015, p. 6, 20, 30). Seventy percent of the total Australian exports are minerals, coal and natural gas (DFAT 2015a, p. 60). This percentage would increase if exports of processed metals were included in the calculation. Iron ore and coal components of this total figure are 28 and 15 percent, respectively (DFAT 2015a, p. 132). Australia's trade to GDP ratio is also high at 42 percent (The World Bank 2015b). It is therefore easy to comprehend how the economic geography of Australia is shaped by exports of resources. The availability of vast volumes of resources, and the close proximity of the Asia Pacific industrialization (Japan, Taiwan, South Korea since the 1960s and China from the 1990s onwards) are two factors that made Australia a major resource exporter. Presently, 2015 China-Australia free trade and investment agreement is increasing Chinese ownership of Australian resources, and their exports to China and elsewhere. This will possibly replicate the economic history of the Japanese MNEs' ownership levels of the Australian resources and their global exports of these resources that began in the 1960s (see for example, CEDA 1997). As such, China's largest coal mining and export government sponsored MNE Shenhua is currently developing a coalfield of 4084 hectares, with an investment of A$1.2 billion (Wen 2015).

FROM TARIFF PROTECTION TO NEOLIBERAL DEREGULATION

From the 1901 federation onwards, tariff protection against imports formed a cornerstone of the federal government policy framework and sustained parts of the Australian economy, but viability of this system came under increasing scrutiny as the post-World War II boom ended in the 1970s (Bayari 2014, 2012e). Tariffs shaped the Australian economic geography for decades by deflecting and diffusing the effects of the global economy. The post-World War II Keynesianism came under pressure from the internationalization of capital and its demands to free up the Australian markets and liberalize the nation's trade and investment rules (Fagan & Weber 1999, p.142-143). Historically, capitalist economies were characterized by public ownership of electricity, telecommunications, water, finance, resource extraction, and transportation (Henisz 2003, p. 177). Economic nationalism, and the notion that unique and valuable productive assets should not be under foreign control, was the rationale for many government restrictions on foreign investment inflows prior to the instigation of deregulatory policies (Dunning et al. 2008, p. 12). In Australia, from the 1980s onwards, under neoliberalism, tariffs were reduced radically, markets [capital and labor] and foreign investment rules were deregulated, and transport, utilities, and telecommunications industries were privatized (Quiggin 2001, 1999, Wilkie 2009). Australia's economic base has always been a geographically fragmented, with an undersized domestic market and a largely migration-driven labor force (Fagan & Weber 1999, p. 146). Economic activity determines the size and geographic dispersion of the labor market. Mining activity, for example, leads to internal movement of skilled and unskilled labor. Overall, economic geography of the fragmentation has been visible in the distribution of the manufacturers across the Australian states (Victoria and South Australia still being the most industrialized), which was an outcome of the lack of federal government guidance and the competition between the state governments to provide incentives to attract foreign investment during the post-World War II boom (Beeson 1999, Edgington 1990, Fagan 2008). In the 1980s, federal government's own neoliberal economic manifesto proposed, among other powerful notions, that deregulation and tariff removals would lead to an export-driven high-value added manufacturing industry (Garnaut 1989, p. 103, 211). Manufacturing industry, which had been largely foreign investment-driven and uncompetitive due to its small scale, and high labor costs, began shrinking once it was subjected to decreasing tariff-protection against imports from China, Japan, Taiwan and South Korea (Bayari 2012c, 2012d, 2013e). Overall, the post-World War II high value-added industrialization efforts by successive Australian governments were unsuccessful (Jacobs 2011, p. 26, Suich 2007, p. 23, Wooding 2008, p. 60). There is a prior coverage of the decline of manufacturing in Australia and the same ground will not be treated here (Bayari 2011).

The Australian mining industry welcomed the removal of tariffs, and the deregulation of foreign investment rules, which reduced restrictions on foreign ownership levels and decreased extraction costs (see Banks 2005). Consequently, there was an increase in real value-added activity in the mining industry but the massive growth phase came much later (Richardson 2009, p. 4). With the deregulation, Australian federal and state governments began to provide more incentives for foreign mining investment (Denniss & Richardson 2013, Stilwell 2008). Mining MNEs always factor in the rate of extraction in their investment decisions (Teece 1986, p. 39). As a result of the deregulation, foreign mining MNEs became able to hold several licenses to extract the same resource, and were relatively successful in reducing costs by determining extraction volumes and speed (see Beeson 1997, p. 140, Beeson 1995, p. 80). Mining industry has continuously grown with the increase in demand from Asia in the last eight decades (Leaver 2011, p. 2). The last two decades in particular were different.

The 2003-2011 "commodities super-cycle" [2011 being the peak of metal and coal prices] was the longest and broadest in history (Nkurunziza 2015). In this period, mining investment as a share of Australian GDP was significantly higher than the previous mining booms, and the volume and price of resource exports arose much more strongly and rapidly, driven by Chinese demand, especially from 2005 onwards (Battellino 2010, Corden 2012, Richardson 2009). This Australian mining boom was a part of the "super-cycle" expansion. This expansion was defined by above-trend price movements in a wide range of commodities, mostly inputs for industrial production and urban development, predominantly in China, as well as India, South Africa, Brazil, Russia and elsewhere (Erten & Ocampo 2012, p. 2). Chinese urbanization, in particular, has fuelled Australian resources and energy mining (AUSTRADE 2015, p. 3). Commodities prices were low in the 1980s and 1990s, due to the composition of global growth at the time, which was dominated by growth in IT, insurance, media, and finance industries in the West, but commodity-intensive' growth fed by urbanization and infrastructure construction in China and elsewhere caused this "super-cycle" (Bonham 2014, p. 3). Substantial global factors [such as the post-2008 quantitative easing in the EU and North America] may have somewhat contributed to this "super-cycle" (Konold & Espinal 2014). The end of the peak price period represents a decline in Chinese imports of minerals, coal, natural gas and crude oil. This does not necessarily affect the trade of other commodities, which in conjunction with the growth in emerging markets, may mean that there will be no drastic long-term reversal of some commodity prices. (see Canuto 2014, p. 3). From the perspective of the China Australia free trade and investment agreement (ChAFTA), signed in June 2015, the drop in Chinese demand for resources may not amount to a long-term problem. The agreement, when fully implemented, will enhance the way in which Australian supply is locked into Chinese demand, ease the conditions for Chinese investment and remove any remaining tariffs. The mining industry has welcomed the prospect that the ChAFTA will increase the minerals and energy exports to China (MCA 2015). The size of the Chinese economy is significantly larger than it was at the start of the "super-cycle." This means that even a slower rate of growth in China will still require considerable Australian resources due to the continuing process of urbanization and infrastructure construction. In the next four decades, 292 million Chinese people will move from towns and villages into urban areas (United Nations Department of Economic and Social Affairs Population Division 2014, p. 12). Even if the "super-cycle" peak prices do not ever come back, demand from China will continue. This will lead to new foreign investment in the Australian mining industry.

FOREIGN INVESTMENT

It was Australian governments that first brought foreign financing into the mining industry when they began borrowing from overseas to pay for the infrastructure spending during the 1850s' mining boom (Blainey 1963). Foreign investment in Australia's mining industry increasingly intensified, leading to the present market governance structure that developed and modified over time. From the late 1950s onwards, mining companies were discovering massive iron ore deposits in Australia, that attracted foreign interests, especially from Japan, and the federal and state governments began to provide tax concessions and incentives to attract mining foreign investment (Phillipson 1974, Kerr 1975). When the iron ore and coal discoveries were continuing in Australia, Japan's main exports were textiles and clothing and China had a troubled domestic market (see Ergas et al. 2010, p. 10-11). Other Asian markets, such as South Korea and Taiwan were still budding. Thus, the economic geography of markets for Australian resources was quite different. As the markets in Asia have grown so has the size of the Australian mining industry.

Rugman's 'regionalization paradigm' states that the majority of MNEs' trade and foreign investment activities are regional (that is, the assets and sales of a MNE of a region are largely concentrated in that region) (Rugman & Verbeke 2004, p. 3-5, Rugman & Verbeke 2008, p. 312, Rugman et al. 2011, p. 21). This framework is relevant to Australia. The Asia Pacific region has long been the major importer of Australia's mineral, coal, and natural gas resources. This region is also the most significant factor in further development of these resources. China, Japan, and South Korea are Australia's top three markets and, in combination, they take 55 percent of all Australian exports (DFAT 2015a, p. 41). Australia has signed free trade and investment agreements with these three nations. 66 percent of all exports to China are iron ore and coal, and the figures are 47 and 55 percent for Japan and South Korea respectively (DFAT 2015a, p. 100, 107, 113). Clearly, MNE mining and export activity in Australia displays a regionalization pattern. In the late 1970s, Japan's massive need for high quality coal for its metallurgy sector led to the expansion of the Australian mining industry. However, for a long time the natural gas industry did not take off due to the lack of export markets and the absence of infrastructure, processing, transport and logistics facilities (see for example Leaver 2009, p. 124, 126). Japan was the closest, and potentially the largest natural gas market in the 1980s and 1990s. However, its energy policy consisted of a mix of fuels that included natural gas imports from Persian Gulf. The Australian natural gas resources had no other potential markets for a long time. The rise in the environmental awareness after decades of decline in air quality in Asia (China especially) and other factors including a decrease in costs began to shape the preference for natural gas over other fuels. Foreign investment in the Australian gas industry has been increasing with upsurge in demand (Forcey & Sandiford 2015, p. 15, Leaver 2009, p. 131). As of July 2015, there were seven liquefied natural gas projects, worth a total of A$193 billion, due to be completed within two years (Macdonald Smith et al. 2015). Presently, natural gas is the third largest Australian export and forms 6 percent of the total (DFAT 2015a, p. 132). Australia's next resources boom will be in the extraction of natural gas, and production and export of liquefied natural gas to Asia within the next decade (Chessell 2015, Corden 2012, Woolrich 2015).

Mining MNEs are characterized by their possession of asset-exploiting type of foreign investment to extract resources, augment their markets, create new ones and co-ordinate and integrate existing cross-border operations (Dunning et al. 2008, p. 9). Overall, energy and mineral resources are subject to demand and price variations in global markets, which are the domain of MNEs (Sandalcilar & Altiner 2012). Australia has always suffered chronically low domestic investment and has been forced to be a net capital importer (Bishop & Cassidy 2011, p. 15, Fisher et al. 2008, p. 9). The level of total foreign investment (foreign direct investment, portfolio investment, securities holdings, etc.) in Australia has always been higher than the level of total Australian investment overseas (ABS 5352.0 2015). In 2014, net foreign debt was 55 percent of GDP and much of the increase in foreign debt since the neoliberal deregulation can be traced to foreign investment in mining (Kryger 2014, p. 2). Foreign ownership in mining was less than 30 percent in 1962 when its share of GDP was 1.5 percent (Galligan 1987, p. 35). In 2014, mining industry's share of GDP was 9 percent and the foreign ownership levels had reached 83 percent (ABS 5204.0 2015, Grudnoff 2013, p. 1). Foreign investment in mining projects is driven by estimates of future demand (Forcey & Sandiford 2015, p. 4). If Australia is to continue to have a resource-export driven economy, the bulk of the investment need to be imported, i.e. foreign investment. This is because in order to start new extraction sites, the Australian mining industry needs levels of investment that are higher than the levels of profits derived from the present activities. For example,

since 1998, foreign investment in the crude oil and gas industry has been more than double of its cumulative profits over the same period (APPEA 2015, p. 9). There cannot be a natural gas export sector in the future if there is no foreign investment now. In 2005-2011, overseas demand, primarily from China, led the mining industry to almost double in size (Corden 2012, p. 3). If governments had placed restrictions on foreign ownership, the Australian mining industry's size and its exports would have been much smaller. Annual inflows of foreign direct investment in Australia have averaged 2.2 percent of the GDP in the period of 1970-2014, though it had risen to 3.4 percent in 2004-2012 [that encompasses, roughly, the period of "commodities super-cycle"] (The World Bank 2015a). The Australian mining industry, to remain viable, needs to be responsive to global demand conditions in terms of price, delivery schedule and volume. The function and necessity of MNE foreign investment arise in the course of fulfilling these conditions. This is especially applicable to "greenfield" ventures (see DFAT 2015b, p. 5). Such ventures are often in sectors (for example natural gas exploration, extraction and liquefied natural gas processing) that mostly interest MNEs, due to capital requirements and very long term return on investment.

GOVERNMENT ASSISTANCE

Economic geography of Australia began with government spending on infrastructure, services, utilities, communications, energy, etc., and it was in the 1930s when private capital investment surpassed public investment (Butlin 1982, p. 82-84). Long before the age of Keynesian interventionism, there was an overriding need for an interventionist government in Australia. The Australian market emerged as a result of government initiatives and the Australian economy could not have come into being without this paternalism (Kelly 1992, p. 2). Government intervention is continuous. In 2015, the federal government has allocated A$5 billion for spending to develop Northern Australian economy [defining an area to the north of Tropic of Capricorn across Western Australia, Northern Territory and Queensland] (Department of the Prime Minister and Cabinet 2015, p. 84). The launch of this spending program has accompanied overseas events to attract foreign investors. Mining has been a defining feature of the Australian economic geography ever since it opened up a new utilization of land that was separate from agriculture and grazing. To state the obvious, mining can only take place where the resources are located. This has been a continuous challenge in Australia because it is a continental nation with a predominantly coastal population, which in turn has required construction of extensive logistics, transport, service and port infrastructures (Butcher 2008). The Australian mining industry has always had to depend on government assistance. A mining industry as large as the one in Australia could not have started and developed so rapidly and extensively without government intervention. MNEs expect specific government mechanisms to protect themselves against risks of revenue loss when they invest in a market (Dunning 1995, p. 464, 483). Subsidies are inherent to government and MNE interactions. Dunning's 'eclectic paradigm' of 'ownership-locational-internalization advantages', [OLI], has been instrumental in defining and evaluating trade, and foreign investment activities of MNEs and their interactions with host markets (Dunning 1988, 1993, 1995, 1997, 2006). Rugman offers a further dimension to the 'eclectic paradigm', by arguing that locational advantages include natural resources, infrastructure, and governance structures and that organizational advantages include what MNEs can induce governments to provide, as in the character of access to the natural resources of the host country, whereby 'locational advantages' (natural resources) actually become 'organizational advantages' (Rugman 2010, p. 2-3). In this instance, locational advantages that foreign MNEs enjoy in Australia are availability of vast volumes of resources, subsidies provided by governments that are integrated with their ownership of foreign investment and trade

network advantages. Accordingly, government assistance to mining industry is also a 'locational advantage.'

Principally since the 1960s, but increasingly since the late 1980s, Australia has maintained, at both federal and state levels, robust mechanisms to offer subsidies to MNEs in the nation's mining and energy industries (Buckman 2010, Cahill & Beder 2005, Frankel 2009, Goods 2011, Grudnoff 2013, Hamilton & Turton 1999, Pearse 2010, Richardson 2009, 2012, Suich 2007, Turton 2002). This system has been maintained by successive Australian governments and has become more extensive in the era of neoliberal deregulation. Effectively, government infrastructure spending benefits all industries. A recently announced example of a federal government funded infrastructure projects is the A$10 billion and 1,700 kilometer Brisbane-Melbourne goods rail track (Glenday 2015). As such a high capital investment is estimated by private capital to be unrecoverable for a period of more than five decades, federal government has decided to finance it. There are several different estimates of levels of subsidies to the mining industry in Australia (see the discussions in Davidson (2012, p. 24). Australian federal government subsidies to the mining industry is worth over A$4.5 billion annually and include the items of fuel tax credits, capital works expenditure deduction, exploration and prospecting deduction, capital expenditure deduction for mining, quarrying and petroleum operations, jobs subsidies and R&D tax concessions (Grudnoff 2013: 4). At the state level, the Queensland government subsidies to the coal industry amounted to over A$8 billion in 2008-2014, and consisted of spending for sea ports projects, discounts on access to state rail networks, upgrading coal plants, costs for exploration, development, mine fleet and land rehabilitation (Campbell 2014a: 22). The New South Wales state government subsidies to the coal mining industry is estimated to be close to A$872.8 million in 2008-2014 (Campbell 2014b: 10). While the above discussion refers specifically to the coal mining industry, Table 4 shows the breakdown of all the state government subsidies for the fossil fuel industry and mining industry combined, per state and territory in 2008-2014. To be sure, subsidies also include cash payments as well as the items outlined above, though the ratio of the items is different in the each state government budget (Peel et al. 2014: 2).

Table 4: State governments' subsidies (in A$ millions)

STATE GOVERNMENT	SUBSIDIES IN 2008-2014
Queensland	9,541.1
Western Australia	6,215.5
New South Wales	872.8
Northern Territory	406.7
South Australia	316.2
Victoria	205.7
Tasmania	54.1
TOTAL	17,612.1

Source: Peel et al. 2014: 4.

The total of all the state subsidies amounts to A$17.6 billion for the period. These are crucial for the continuing foreign investment. In a recent example, the Indian energy MNE Adani's A$16.5 billion Carmichael coalmine investment in Queensland has attracted A$2 billion seaport expansion subsidy from the Queensland state government which is reportedly planning to provide more subsidies to the project (Campbell 2015, Ludlow 2015: 10). The primary rule of markets, irrespective of institutional characteristics, is that the largest ones dominate the rest (Casson & Lee 2011, p. 34, 35). Mining is the largest Australian industry, which provides 70 percent

of the export volumes and it thus draws more subsidies than others. Even between mining booms, it is expected that government assistance, spending allocation for infrastructure and other areas, will continue despite the weaker fiscal base (Argy 2008, p. 110). It is difficult to envisage a different scenario.

THE 'DUTCH DISEASE'

The term of 'Dutch Disease' was coined in the 1960s, following the Netherlands' natural gas discoveries in the North Sea and the subsequent boom, which appreciated the Dutch guilder and had adverse consequences for other industries, particularly the manufacturing (Corden 1984, p. 359-360). A retro diagnosis of 'Dutch Disease' was made in reference to the 19th century mining booms in Australia (Maddock & McLean 1984). The early 20th century mining booms in Australia caused a reduction in the size of the manufacturing industry and its exports, presenting a case of 'Dutch Disease' (Corden & Neary 1982, p. 825). However, the 'Dutch Disease' that accompanied the 2000s-2010s mining boom in Australia has not been strong and it has not greatly affected the manufacturing industries (Corden 2012, p. 29-31, Downes et al. 2014, p. 1, 25, Ploeg 2010, p. 17). The tariff removals that began in the late 1970s and the neoliberal deregulation from the 1980s onwards, are primary causes of the decline in the value added manufacturing in Australia (Bayari 2012a). There is a further dimension to this matter. Australia does not manufacture the specialized mining equipment such as machinery, trucks, parts and mining tools, the imports of which greatly increased during the last boom (Reserve Bank of Australia 2011, p. 43)Very high levels of mechanization have long characterized the Australian mining industry, which depends on these imports. The exchange rate appreciation that accompanied the 2000s-2010s mining boom reduced import costs, which, in turn, reduced the cost of investment in the industry. Diagnoses of 'Dutch Disease' in future Australian booms will depend on the relevant circumstances of the time. There is debate over the diagnoses of 'Dutch Disease' in developed nations with large resources industries (Cavalcanti et al. 2012). Canada is one relevant example. Commodities, including crude oil, prices rise during "commodities super-cycle" led to Dutch Disease in Canada and stagnated the manufacturing sector in 2002-2009 (Beine et al, 2009, p 27, Beine et al. 2014, p. 49, Boadway et al. 2012, p. 42, Coulombe 2013, p. 12, Courchene, 2010, p. 16). Australia and Canada are two Anglo Saxon economies that both possess large mineral and energy industries, and have historically had similar sized GDPs (Acemoglu et al. 2011, Harchaoui et al. 2005, Stevens 2009). Statistics in relation to the Australian mining industry was given above. The mining industry forms 8.4 percent of Canada's GDP and the manufacturing industry's share is bigger at 10.6 per cent (Statistics Canada 2015). Canada has led Australia in minerals and energy exploration investment since the 1980s, and also possesses approximately double the number of mining suppliers, including mining machine manufacturers (Stothart 2012: 12, 40, 48, 52). Canada has integrated its trade and investment with the US, since the signing of the 1994 North American Free Trade Agreement (NAFTA) (Davis 2012, Stevens 2009). The US is Canada's largest export market and the two are the largest trading partners in the world (Government of Canada 2014). The low logistics costs for Canadian exports to the US are an important factor that reduces the cost of investment in the Canadian mineral and energy industries. All these factors offer some explanation why the Canadian manufacturing's share of GDP is larger, and why the nation has more mining equipment manufacturers. It needs to be stated briefly that the comparison of Canadian and Australian systems of taxation on the mining industry displays a complex picture. Australia's top corporate tax rate federally is higher than that of Canada but the latter has additional taxed levies by the nation's provinces (Ralbovsky 2012: 11). In comparison to Australia, Canada displays a "real" federalism with

elaborate mechanisms for fiscal harmonization such as conditional transfers, tax collection agreements, tax abatement and tax base sharing (San Miguel 2015). Canada's biggest energy industry is crude oil, which is derived from oil sands, and this industry has the lowest corporate income tax on mineral and oil industries in North America and among the G7 nations (Marshall 2015). Many Canadian equipment manufacturers also serve same industry, in Canada, and across the border in the US. Overall, in Australia there are different levels of stamp duty levied by the states that complicates a comparison for which there is no space here, and a further dimension to the complication is the 'goods and services tax' in Australia, that upholds the financial integrity of the federal system (Strong 2013: 5). This is, however, beyond the scope of this paper.

CONCLUSION

This paper has discussed the roles played by the Australian mining industry, foreign investment and government in the continent's transformation into a mineral and energy export system that forms over 70 percent of annual Australian exports. The largest markets of these exports are in Asia. The significance of this lies in the fact that Australia has long had a highly trade dependent economy. The paper has also highlighted two significant periods in the history of mining industry, the period of neoliberal deregulation in the 1980s-1990s and the mining boom period of the 2000s-2010s. The paper has defined the rise of the Australian resources market in response to long distance trade.. The Australian mining industry has expanded in several stages. From the 1850s onwards, the gold rush forced governments to borrow funds from overseas to build infrastructure. From the 1950s onwards, high volume discoveries of resources benefited Japan's post-WWII reconstruction and created a trade, and foreign investment order between Australia and Japan. The Asia-Pacific location of these two nations was a major factor in the establishment of this relationship. The same applies to the subsequent trade and investment relationships Australia has established with Taiwan, South Korea and more recently China. The 1980s' neoliberal deregulation made a lasting impact on the mining industry, in terms of easing foreign investment and ownership rules even though resources prices remained low in the 1980s and 1990s. It was the "commodities super-cycle" of the 2000s-2010s that has massively expanded the mining industry, displaying the significance of the role of foreign investment.

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