

**NATURAL RESOURCE EXPORTS, WEALTH ACCUMULATION  
AND DEVELOPMENT IN SETTLER ECONOMIES:  
NORTHWESTERN ONTARIO AND SOUTH AUSTRALIA 1905-1915**

**By**

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## **ABSTRACT**

We compare the wealth holdings of probated decedents in two British settler economies, the Thunder Bay District (TBD) in Northwestern Ontario and South Australia (SA) for the period 1905 to 1915. Our aim is to investigate some of the determinants behind successful and unsuccessful development around natural resource exports. We are looking at the effects of a common resource for export, wheat, in the same decade, 1905 to 1915, on the accumulation of wealth in two economies where institutional quality should be comparable. South Australia benefited from an earlier wheat export episode from 1850 to 1870 whereas in 1905, the TBD was really a new economy that stood where SA did in 1880. Adelaide, the capital of SA is a coastal port that served as a direct gateway to the world grain market, whereas the Lakehead, the major center of TBD, was an intermediate terminus on the Canadian transportation system as grain would have to have been transferred from Great Lakes Freighters to ocean going vessels on the way to market. While the average wealth level in SA was substantially higher than in TBD in 1905, we find that between 1905-1915, the change in the average wealth levels was equivalent in SA and TBD. As the quantity of grain produced in SA was 4 percent of the quantity shipped through the Lakehead, SA was able to retain more of the income associated with wheat production and transportation. Contrary to the “Curse of Resources” literature, we assess that successful natural resource based development can occur with long-term success hinging on the ability to retain linkages through reliance on domestic sources of capital rather than externally owned capital.

## INTRODUCTION

Sachs and Warner (1995, 1999, 2001) show that resource abundant economies, as measured by dependence on natural resources for export, grew slower than resource scarce economies in the period since 1970. This phenomenon has been dubbed the “Curse of Resources” and has triggered a sizeable literature that looks at the possible explanations for this surprising outcome. Since the empirical findings on growth rates and Sachs and Warner’s measure of resource abundance are robust, it is the identification of the channels through which resource abundance retard growth that is of importance. Sachs and Warner summarize the general strategy for finding the explanation as one of searching for the way in which natural resource exploitation crowds out activity  $x$ , where activity  $x$  drives growth. Explanations that have arisen include “Dutch Disease” type models with path dependent effects of resource booms whereby manufacturing activity influences productivity via increasing returns to scale or “learning by doing.” Other explanations show how high wage primary sector production discourages investment in human capital accumulation; how resource booms result in wage and price inflation that results in domestic manufacturing becoming non-competitive, and how resource booms encourage corrupt and predatory policy that discourages investment in the economy. Sachs and Warner (2001, 833) state, “Just as we lack a universally accepted theory of economic growth in general, we lack a universally accepted theory of the curse of natural resources.”

As Sachs and Warner (2001) note, the Resource Curse is a surprising phenomenon given the expectation that resources can be a catalyst for development.<sup>1</sup> “Staples” (natural resources for export) approaches to economic development describe a process by which “linkages” associated with the natural resource production encourage industrialization

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<sup>1</sup> Sachs and Warner (1999). The policy implication of the resource curse is that developing countries should shun their dependency on natural resource exports and concentrate on strategies for industrialization. The peculiar aspect of this policy prescription is that natural resource exports are an obvious channel for economies to obtain financial resources for industrialization. The long run focus of the Resource Curse ignores the episodic nature of growth associated with natural resource exports due to the volatility of primary commodity prices around the long run trend. Sachs and Warner (1999), however, describe the “big push” where resource booms provide the catalyst for low income economies to overcome the fixed costs of industrialization. Beyond the immediate benefits of the “big push” arising from a positive commodity price shock for the developing country.

provided the linkages are strong enough, and the income associated with them is retained in the domestic economy. The successful development of many of the high income countries of today such as Canada, the United States, Australia, and New Zealand was based on exploitation and export of abundant natural resources such as fish, fur, timber, gold, grain, coal and oil.<sup>2</sup> In contrast, low income but resource abundant economies today such as the oil states of the Middle East and Africa seem to struggle to develop and experience sustained high growth rates in per capita incomes. Where resource abundant developing economies of the nineteenth century managed to industrialize, the resource abundant economies of today remain dependent on their resource sectors.

Sachs and Warner (1995) dismiss the relevance of historical successful resource based development cases for understanding the resource curse. First, they argue that these countries developed in a world of relatively high transportation costs that encouraged manufacturing and processing industries to locate near available resource endowments such as coal. However, this view neglects that in the absence of protectionist policies, countries like the Canada, Australia and New Zealand primarily exported raw, or unprocessed, natural resources and imported much of the manufacturing needs from the distant British market. Canada's rapid growth and industrialization is usually related to wheat exports in combination with railway policy and protectionist trade policies established to capture the linkages of the grain trade. Canada's, Australia's and even the United States' apparent success in industrializing through inward looking policies would seem to be at odds with Sachs and Warner's (1995, 8) expectations concerning the need for openness in order to grow.<sup>3</sup> If the abundance of local power sources and resources for inputs into manufacturing were the key determinant of industrialization, then the failure

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<sup>2</sup> Canada has often been described as an economy that used its natural resource base to industrialize and become one of the highest income countries in the world. Canada's economic development has been described through a series of "staples episodes" that began with Cod, moved to fur, then timber, then wheat. Cod, fur and timber have been assessed as limited staples for development purposes due to a combination of weak linkages associated with their exploitation, and relatively rapid depletion of the resource stocks. McCallum (1980) also highlights the importance of "linkage capture" by local economies. Expropriatory institutions and policies, imperfectly competitive transportation sectors, and reliance on external sources of capital may result in economic linkages arising from resource exploitation in the periphery being captured by an industrialized core.

<sup>3</sup> Crafts (2004, 54) notes "that the United States was a high tariff country throughout its rise world economic leadership".

of much of the US northeast, and Northern Ontario in Canada, to industrialize and develop stand as important historic counter examples.

Second, Sachs and Warner (1995, 2001) argue that successfully developing resource abundant economies of the nineteenth century never had as intensive exploitation of natural resources compared to resource dependent economies of the mid- to late 20<sup>th</sup> century. If we consider the resource intensity of Canada and the United States just prior to their creation as nation states, then we see that these successful developers began as resource based economies. Hughes and Cain (1994, 30) show that in the Colonial economy of the 1700s, nine-tenths of the population were employed in agriculture, fishing, timbering and mining. McCallum (1980) shows that in the mid-nineteenth century Ontario, Canada's industrial heartland today, 2/3 of its population were engaged in farming with substantial cash sales generated from wheat production and 80 percent of wheat production exported.<sup>4</sup>

Finally, Auty (2001) argues that there is nothing deterministic about resource abundance and successful development and sustained growth. He notes that many resource abundant economies grew rapidly between 1870-1913 and 1950-1973. The growth collapses of the late 1970s and early 1980s of resource dependent economies is ironic, he says, since the collapse was the result of resource dependent economies trying to reduce their resource dependence.

Counter to the view of Sachs and Warner (1995, 2001), it could be that the explanation for the "resource curse" may be found in an understanding of why successful natural resource based development has occurred historically but not recently. Our approach is to examine the level, the distribution and the composition of wealth of probated decedents in the Thunder Bay District, Ontario, and in South Australia over the period 1905 to 1915. We are interested in examining how much wealth accumulated

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<sup>4</sup> A comparison of export to GDP ratios for nation states can be mis-leading at any point in history, and particularly mis-leading when comparing across time. Comparing a countries of large area like the United States or Canada where there are several identifiable regional economies engaged in inter-regional, as well as international, trade with smaller area, single region nations like Kuwait is misleading. While the Canadian and United States national economies may not be as resource intensive as some of the resource abundant economies of today, some sub-national economies were and are intensive exporters of natural resources. For example, for the Provinces of Alberta and Saskatchewan, natural resource (international) exports in 1984 were 35 percent of provincial GDP which is higher than Nigeria, Venezuela and Iran in 1970 as shown in Sachs and Warner's (2001) Figure 1.

during these wheat export booms; how much of that wealth was invested in the local economy, and how much was held in assets external to the local economy. We focus on wealth estimates over the wheat boom period since it is likely the better indicator than per capita income growth of the long run benefits of natural resource exploitation for small open economies. Chambers and Gordon (1966) show that the effect of natural resource exports on long run per capita income growth will only reflect the increase in the value of “land”, the fixed factor in natural resource exploitation. Similarly, Rodriguez and Sachs (1999) argue that resource rich economies, particularly those exploiting non-renewable resources, experience a transitory resource boom and “live beyond their means” consuming at a level that declines to the long run steady state associated with the economy’s income once the resource stock is exhausted. This outcome can be avoided if the economic surplus can be invested in international capital markets so that in the long term consumption can be financed out of interest income. Economies that invest their surplus in the home economy, in contrast, will generate temporary booms in consumption and production unless the surplus can be used to diversify the production base of the economy away from resource export reliance. The population of the resource economy benefits from higher consumption levels even if they are only transitory. In either case, the accumulation of wealth in the resource based economy is symptomatic of a successful development episode.

A comparison of wealth accumulation in the Lakehead region and in South Australia will allow us to infer some of the determinants behind successful and unsuccessful development around natural resource exports. We look at the effects of a common resource for export, wheat, in the same decade, 1905 to 1915, in two British Settler economies. Institutional quality in these two economies should be comparable even if the institutions are different. There are differences between the two regions that may be informative for identifying the ways in which natural resource exports influence economic development. South Australia benefited from earlier resource export episodes, including copper in the 1840s, wheat and wool in the 1850s and wheat again in the 1870s whereas in 1905, the Thunder Bay District and its port towns of Port Arthur and Fort William was really a new economy. Finally, recent work by Gallup, Sachs and Mellinger (1998) and Rappaport and Sachs (2003) highlights the positive correlation between

coastal locations and income levels but does not provide a satisfactory explanation for why the correlation exists. The grain production in the SA economy was for the most part contained within 60 miles of coast, whereas Port Arthur/Fort William was an intermediate terminus on the Canadian transportation system; grain being transferred from Great Lakes Freighters to ocean going vessels on the way to market. Our comparison of wealth accumulation in these two economies, therefore, may be able to inform us as to why coastal locations are beneficial for economic development.

What we learn from the changes in wealth levels in the two locations is that while average wealth levels in SA were substantially higher than in TBD, between 1905-1915, the rate of increase in average wealth levels was equivalent in SA and the TBD. The volume of wheat passing through the Lakehead was substantially greater than the quantity of wheat produced in SA but SA was able to appropriate more linkages from the boom enabling it to match the Lakehead's growth. The higher wealth levels in SA relative to the TBD during the 1905-1915 period is rooted in the fact that SA was a region of older settlement and over time earlier wealth accumulation was able to compound into higher levels relative to the more newly settled TBD. Long term economic development from natural resources is therefore a function of the ability to retain linkages from the resource activity as well as the passage of time necessary for linkages to develop and wealth to accumulate.

### **Wheat Exports and their Impacts on Two Settler Economies**

The years 1905 to 1913 were an important period for the economic development of the Thunder Bay District and the South Australian economy. For TBD, this was the period of initial substantial development while for SA, the period saw the return of prosperous economic conditions following more than a decade of economic stagnation.

The European settlement of the Thunder Bay District began during the fur trade when it was home to Fort William, the inland headquarters of the Northwest Company of Montreal. The coming of the transcontinental railway in the 1880s linked the region to the Prairie wheat economy and central Canada. The Thunder Bay District was uniquely juxtaposed between the Prairie wheat economy, from which it would benefit by having its major metropolitan centre serve as entrepot, and central Canada, where it was part of

Canada's wealthiest province. The northwestern portion of the province, along with the Thunder Bay District, was directly tied to the Prairie Wheat Boom via the grain port function of the twin cities of Fort William and Port Arthur known collectively as the "Lakehead".<sup>5</sup> Moreover, a portion of the economy was rooted in local manufacturing development, resource extraction and agricultural development.<sup>6</sup>

The population of the district grew rapidly with the greatest expansion between 1901 and 1911 when the population nearly tripled to approximately 40,000. Most of the population growth during the boom period occurred at the Lakehead as the result of high in-migration and by 1921 over 70 percent of the District's population was at the Lakehead. The economic boom at the Lakehead appears to have come to an end with the onset of the First World War. The increase in interest rates in 1913 tightened farm credit and brought about a halt to the expansion of the wheat boom that was then accompanied by the disruption of the war and the reduction in immigrant flows to the west. The opening of the Panama Canal in 1914 may have also directed some of the flow of wheat and commerce away from the Lakehead and to the west coast. The value of building permits in Fort William rose steadily from 1907 and peaked in 1912 at just over 4 million dollars and then fell dramatically for the next four years to reach 0.6 million dollars by 1916. At least a dozen major employers shut down from 1914-22 and the size of the labour force declined. Recovery did not begin until the construction of the first pulp mill in 1917.<sup>7</sup>

The European settlement of South Australia was barely 70 years old in 1905. South Australia had a rural based economy founded under a system of 'systematic colonization' to produce a self supporting system financed by land sales aimed at avoiding the financial and social crises of other Australian colonies or the problems related to penal colonies. Despite initial difficulties, within twenty years of settlement the colony boasted a population of 85,000 and over 160,000 acres of wheat were sown, with a large portion being used to feed the gold rushes in the neighboring colony of

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<sup>5</sup> Di Matteo, "Economic development of the Lakehead", *Evidence on Lakehead*, "Booming sector".

<sup>6</sup> Gross regional product in the absence of the wheat boom at the Lakehead would have been 42 per cent smaller. In addition, by 1921, there were 1,534 farms supporting a rural population of 7,397 around the Lakehead. Forestry also employed thousands, in extraction, at sawmills and at the three pulps mills either operating or under construction by 1921. See Di Matteo, "*Booming sector*", p. 611-614.

<sup>7</sup> Stafford, "*Century of growth*", pp.44-45 and Di Matteo, "*Evidence on Lakehead*".



Victoria.<sup>8</sup> By 1901, the first year of Australian federation the population of the new state of South Australia was 359,000, with 162,000 or just over 42 percent living in the capital Adelaide.<sup>9</sup> A decade later the state's population reached almost 410,000, with Adelaide accounting for around 50 percent of the population.<sup>10</sup>

Apart from remaining preeminent in wheat production within Australia until the 1890s, South Australia also developed a significant pastoral industry. Together these gave the economy a large agricultural base for wealth accumulation, and heavy exposure to the risk of drought. While no extensive gold deposits were found in South Australia, copper deposits north of the capital provided an alternative resource export for over 60 years. Wheat, wool and copper, together with benefits of being the nearest capital to the silver and lead deposits at Broken Hill underpinned Adelaide and South Australia's growth through the 19<sup>th</sup> century. Compared to the other states of Australia, South Australia had the advantage of agricultural land that was comparatively close to the capital, and relatively easy to clear.<sup>11</sup> This also contributed to development of a network of rail lines, many of which carried wheat to Port Adelaide and from there, directly to London.<sup>12</sup>

Despite South Australia's early expansion in wheat exports (and lead in the use of agricultural machinery), it took some time for farmers to understand their environment. From the mid 1850s average yields declined in South Australia until a slight upturn in the late 1860s. Offsetting the decline was the expansion of acreage. Despite considerable research into the topic it was not until new varieties of wheat were developed and planted in the late 1890s, and these were combined with more effective use of fallowing and

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<sup>8</sup> Stevenson, Tables 1.1 p13, in Vamplew et al.

<sup>9</sup> Hirst, 1973, pp 227-228.

<sup>10</sup> In 1911 the population of Adelaide was just under 190,000, representing 46.4% of South Australia's population. Equivalent figures for 1871, 1881, 1891 and 1901 are 33.8%, 37.6%, 42.2% and 45.3%. By 1921 the percentage was 51.6 % (Hirst, 1973, pp 227). Ontario had a more dispersed urban settlement pattern. In 1891, Toronto - Ontario's largest city - had a population of 181,000 which represented less than 10 percent of the province's population. In 1891, only 35 percent of Ontario's population could be considered urban - that is living in centers of 1000 or more.

<sup>11</sup> Dunsdorfs (1956), pp 99-106.

<sup>12</sup> Until the 1870s Australia as a whole was not a consistent exporter of wheat with the colonies of New South Wales, Victoria and Queensland being net importers until 1867. Against this trend South Australia became a net exporter comparatively early, exporting a (then record) 3 million bushels to Great Britain in 1872. Despite large annual fluctuations (that impacted on the local economy) this trade continued through the period of interest (Dunsdorfs, 1956, pp167-168). Note too that in 1870 there were only 133 miles of railway open in South Australia, while by 1900 there were 1,736 miles- two thirds of this being built after 1880. (Butlin, (1964)[1976] p.321.)

fertilizers that average yields per acre again increased. A major factor impacting on the South Australian economy, however, was out of the control of settlers; drought. Droughts of differing levels of severity occurred in the 1860s and the 1880s, while the combination of the depression in the early 1890s followed by one of the worst droughts ever recorded (from 1895-1903) put significant brakes on economic prosperity. A further drought at the end of World War I slowed economic recovery.<sup>13</sup> The First World War not only made trading agricultural products with Europe difficult, it also impacted heavily on the workforce. The period from 1914 to the 1940 was one of relative stagnation of living standards for the whole of Australia (McLean and Pincus 1983) and South Australia was not an exception.

SA was geographically distant from the Atlantic economy, but culturally and historically linked to England. Although distant from either the centre of world financial markets of London, or the newly emerging industrial strength of North America, it still felt itself to be part of, and integrated with, the modern industrial world. Changes in transportation affected the State's external trade. The great circle route (south from England until the roaring 40s below South Africa, west to Australia and then after leaving Australia, back to 40° south and around the Cape of Good Hope) meant that in the 1870s clippers took 80 days to get to England. The opening of the Suez Canal in 1869 and the rise of steamships changed the technology of shipping, although in 1883 still only one-third of cargo returned to the UK via the Suez. It was not until 1911 that steamers replaced clippers in the wheat trade.<sup>14</sup>

The onset of Australian Federation in 1901 also brought a change to trade arrangements. As a colony, South Australia had levied its own tariffs and customs prior to 1900. Until 1877 there was a 10 per cent ad valorem duty on imported wheat while from 1888 until 1900 South Australia charged 2s per cental (100 pounds) on wheat. Only Victoria was seen as being seriously protectionist in outlook and practice.<sup>15</sup> Federation

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<sup>13</sup> For example, in pre-drought 1891 there were 7.6 million sheep in South Australia; by the end of 1914 there were only 3.6 million. (Vamplew et al, Table 11.9)

<sup>14</sup> According to Dunsdorfs (footnote 12, page 172) "Steamships became firmly established in the wheat carrying trade only between 1905 and 1909, or even 1911. The Official Yearbook for New South Wales reported for the year 1905-06 (p.349) that three-fourths of the wheat exported was carried by sailing vessels. For 1911 the same source (p 438) states that since 1909 sailing vessels had been replaced by steamers: "...the proportion of wheat now carried in sailing vessels is very small".

<sup>15</sup> This section leans on Dunsdorfs, 1956, p 165-167.

removed customs duties between the states, while overall Australia, like Canada, adopted a protectionist regime.<sup>16</sup> Thus, prior to 1900, SA had the ability to capture linkages through protectionist policies, but after 1900, they were not able to do this. On the other hand, the TBD was never able to set its own independent tariff policy.

South Australia benefited not only from the transport of grain via Adelaide but also from the actual production of wheat in the region. In other words, it also earned substantial rents from the land factor which would not have been available in the case of Thunder Bay. The Thunder Bay District benefited from transporting prairie grain in a manner described by McCallum (1980) – the appropriation of linkages from a staple produced far from the region. In addition, the South Australian wheat boom economy began earlier than the Thunder Bay District's, was more regionally focused in terms of the economic impact and had its transport functions centralized via Adelaide.

While the Lakehead towns were the dominant metropolis of their region, they did not have access to the rich and compact agricultural hinterland that Adelaide did and their economic growth was largely dependent on their transshipment function which they increasingly had to share with Vancouver, Montreal and Quebec City. The railways that shipped grain to the Lakehead and the shipping companies that took the grain from the Lakehead represent external capital/businesses for the Thunder Bay district and as such, the share of income earned by that capital would not have been retained in the region. Adelaide, on the other hand was able to create a virtual locational monopoly on grain shipping out of its relatively compact region. The average rail distance wheat had to be transported by rail in South Australia was 50 miles. Despite the development of other ports along the coast in the 1870s, Meinig (1962, 140) describes the overall design of the rail network as “long extensions deep into the interior, not only to serve the pastoral and mining regions, but also as instruments of grand strategy to capture a major share of the interior trade of neighboring colonies.”<sup>17</sup> It is also important that all

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<sup>16</sup> Pomfret, 2000, p 116. In 1913 Canada had an average tariff of 18% and Australia 17%.

<sup>17</sup> As a further example of the possibilities to ‘extract more’ from wheat production, The 1908 Royal Commission on “The Question of the Marketing of Wheat” in South Australia, found that merchants purchasing wheat from farmers colluded so as to reduce the prices received by farmers by 1d to 2d per bushel. A similar enquiry in Victoria found evidence of ‘sharp practice’ that resulted in wheat bags being systematically under-weighed by 1.1 to 3.3 per cent. (Dunsdorf, 1956 pp 223-226).

railways in SA were state owned so that the transportation income was retained in the SA economy.

South Australia had a substantial head start in terms of economic development. While 1885 represents the dawn of grain shipping at the Lakehead and the full prairie wheat boom was still over a decade away, in 1885, South Australia exported almost 8 millions bushels of wheat and flour and the population of South Australia was over 70,000.<sup>18</sup> However, during the period 1905-1915, while wheat production boomed in both SA and Canada, the volume of wheat production in Canada far exceeded that of South Australia (See Table 2) and indeed the volume of wheat shipped through the Lakehead was far greater than that through Adelaide. Whereas South Australia's wheat production and exports during the 1880s were comparable in scale to those of the Ontario economy in the 1850s and 1870s,<sup>19</sup> the 1905 to 1915 period saw wheat shipments through the Lakehead that dwarfed the size of wheat production and exports of SA (See Figure 9). Given both countries sold on the world wheat market, from 1905-1915, the Canadian grain economy should have generated income at the Lakehead many times larger than that seen in SA. There are two ways in which these differences could be apparent; in the overall increase of the economy and population, and to the extent that linkages are retained/captured, in wealth estimates.

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<sup>18</sup> Canada exported 5.2 million bushels of wheat and flour in 1885 (Series M305, Historical Statistics of Canada, 2<sup>nd</sup> Edition). By 1911, exports of wheat and flour from Canada reached 98 million bushels.

<sup>19</sup> See McCallum (1980), Table s.3 .

## MODELLING THE IMPACT OF THE WHEAT ECONOMY

The export of natural resource products initiated the economic development of regions of recent European settlement such as Canada and Australia. The economic development of resource abundant, sparsely populated regions has been explained by the classic staples approach or models of export-led development as originally set out in the work of H. A. Innis.<sup>20</sup> who followed earlier work by G.S. Callender (1902, 1965[1909]) and W.A. Mackintosh (1923). Modern versions of staple theory see economic development as a process of diversification around an export base.<sup>21</sup> The production of the export staple is represented by a production function that gives rise to economic linkages between the staple exporting industry and the economy, such as the demand for production inputs and income generation, which creates a domestic market for consumer goods and broadens economic development. The staples approach with its focus on natural resource exports has served as an explanatory framework for nineteenth century Canadian and Australian economic history.<sup>22</sup>

Another strand of literature has attempted to combine models of export-led growth with models with neoclassical adjustment properties (Corden and Neary 1982; Corden 1983). The 'booming sector' model represents a recent theoretical development that was formulated to assess the impact of booming and lagging export sectors such as North Sea oil in Europe or even the displacement of older industry by more technologically advanced industries. It represents a more rigorous analytical formulation of a model of export-led growth. A booming export sector raises incomes, which stimulate spending in the non-export sector, and supports the development of local manufacturing and service industries. The tendency of the booming sector to attract

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<sup>20</sup> The classic works on Canadian staples by Innis are The Fur Trade in Canada (1930) and The Cod Fisheries (1940). Other important articles are contained in the collection Essays in Canadian Economic History (1956). For an assessment of Innis, see the special issue of the Journal of Canadian Studies, XII, Winter, 1977, entitled "Harold Innis, 1894-1952: Twenty-five Years On."

<sup>21</sup> For relevant literature, see the papers by Baldwin (1956), Watkins (1963) and Caves (1966, 1971).

<sup>22</sup> A comparative study of the success of staples in Canada, Australia and Argentina is provided in Fogarty (1988). For a comparison of Canada and Australia, see Pomfret (1981). Since the late nineteenth century, Canada and Australia have developed more diversified economies, giving rise to the argument that staples are no longer an important force, but they remain small, open economies dependent on a variety of export products - including natural resources - for growth and well-being.

resources from other sectors in the economy is partially offset by the migration of labor and capital.

The booming sector approach provides a way of synthesizing trade theory, which stresses factor endowments and factor mobility, with income expenditure theory, which emphasizes spending shocks, linkages and multiplier effects (Anderson 1991, 24). An export-led model with neoclassical adjustment properties is consistent with either a neoclassical framework, such as that used by Chambers and Gordon (1966) to model the impact of the wheat boom, or the modified version of the staples approach to Canadian economic history (Watkins 1963; Dales, Watkins and McManus, 1967) or even the modified approach to staples proposed by McCallum (1980) which looks at regions appropriating linkages from staple production in other regions.

Most recently, there has developed a literature on natural resources as an economic curse, that is, that countries rich in natural resources tend to perform badly, Almost without exception, “the resource abundant countries have stagnated in economic growth since the early 1970s, inspiring the term “curse of natural resources.”<sup>23</sup> However, this literature is based on recent economic performance as the evidence from Australia and Canada suggest that natural resources indeed can propel an economy forward at least in the short run. The crucial distinction appears to be between short and long run performance. In the short run, natural resource booms generate large increases in economic rents and wealth but the long run impact on an economy depends on the adjustment process of the economy to this increased wealth that invariably returns per capita income to lower long run levels. Indeed, during the adjustment process, there can be a decline in the growth rate of per capita GDP even though the overall size of the economy has grown. Booming sector models suggest that this is indeed the case in the long run.

Booming sector models represent a tool that can be applied to economic history. Booming sector models provide a way of examining export-led development in a framework that incorporates both demand and supply side factors and that does not necessarily have to be applied only to natural resource exports. Mineral production in

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<sup>23</sup> Sachs and Warner (2001) argue that resource-abundant economies tend to be high price economies. Sachs and Warner (1999) present evidence from Latin American developing economies showing that natural resource booms are sometimes accompanied by declining per capita GDP.

Northern Ontario, lumber production in the U.S. Pacific Northwest and automobile production in Detroit could all be examined using a booming sector framework.

The booming sector methodology can even help shed insight on reasons for differential economic development. For example, the U.S. South failed to generate commercial and industrial development on par with that of the North. Part of the reason could be that because of the locational proximity of the South to the North and the associated low transport costs of coastal shipping, manufactured goods and services from the North were perfect substitutes for Southern ones and therefore the booming cotton sector did not spark an expenditure effect and associated development in the South. This could be contrasted with the U.S. West's booming agricultural sector where greater distance and higher initial transport costs due to the absence of coastal trade and transport made imports of Eastern manufactured goods and services imperfect substitutes and therefore sparked local production and ultimately greater economic diversification.

With the Booming Sector model, the process by which the wheat boom affected the regional economies of South Australia and the Thunder Bay District can be outlined. The upturn in wheat prices, which sparked an increase in wheat production, eventually generated greater demand for grain transportation services. This resulted in an increase in the demand for capital and labour employed in grain production and transportation. The increased demand for labour attracted immigrants while capital flowed into the building of transportation infrastructure such as railways and grain elevators. The inflow of labour created a large local market which made the creation of local manufacturing concerns to meet local needs economically viable. As well, the transport infrastructure combined with the ready supply of labour provides an incentive for some manufacturers to locate to serve urban and regional markets.

The impact of the wheat boom and the grain transportation trade on the regional economy can be theoretically modeled using a 'booming sector' model.<sup>24</sup> The region's economy can be divided up into three sectors - grain production and transport (G), manufacturing (M) and services (S). The grain production and transport sector and that portion of manufacturing oriented towards servicing the grain industry can be seen as the export sector for the region. Local manufacturing and services can be taken as the non-

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<sup>24</sup> An overview of booming sector models is found in Anderson (1988) pages 99-109.

export sector. The South Australian economy would consist of both grain production and transportation components whereas the Thunder Bay District would contain only the grain transport component. We assume a production function with capital, labour and land with land as a fixed factor. In the South Australian case, the presence of agricultural land would generate rent as an income while in the Thunder Bay case, the land input would be relatively minor thus generating fewer rents.

We further assume that locally produced manufactured goods are imperfect substitutes for imports while non-local services cannot be substituted for local services. We assume positive income elasticity for both services and manufactured goods. Labour and capital are assumed to be perfectly mobile between the three sectors. Furthermore, in the long run, labour and capital are also assumed to be mobile between the region and the rest of the country. This assumption is a divergence from the usual assumption of a booming sector model that capital and labour are immobile between regions. However, booming sector models were first applied to international economic situations and within a country, there would be no reason why capital and labour would not be mobile over time. Competitive markets are assumed in all three sectors.<sup>25</sup> Finally, we assume that grain transportation and manufacturing are capital-intensive industries while services are labour intensive with the result that the demand for labour in grain transportation and manufacturing is relatively elastic while the demand for labour in services is relatively inelastic.

The pre-boom labour market equilibrium in the three sectors is depicted in Figure 2. As a result of the interregional mobility of capital and labour, in equilibrium, wages in the region are equal to wages outside the region at level  $W_0$ . Total labour employed in the region is equal to the sum of labour employed in each market ( $L_{Go} + L_{Mo} + L_{So}$ ).

We now introduce the boom into this model. There is an increase in the demand for grain products and grain transportation service through the region. This leads to an increase in the demand for labour in grain transportation as well as an increase in the demand for labour in those manufacturing industries directly affiliated with grain

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<sup>25</sup> In the Australian case, regarding the assumption of perfect competition, despite evidence of a cartel among wheat merchants in South Australia, the existence of farmers' cooperatives and the public nature of the Royal commission suggest that in the longer-term at least, it is reasonable to assume competitive markets.



transport. The result is a shift of the demand for labour in both the G and M sectors to the right (D0 to D1). In the very short run, the increase in wages in these two sectors leads to a resource movement effect as labour moves from the S sector and into G and M. As a result, the supply curves for labour in G and M shift to the right (S0 to S1) while the supply curve for labour in the S sector shifts left (S0 to S1). Wages are temporarily equalized across the three sectors at W1. In the very short run, there has been an expansion of the G and M sectors<sup>26</sup> and a contraction of the S sector (See Figure 2).

In the short and long run, there occurs an expenditure effect and a migration of labour to the region from outside the region. In a booming sector model, an increase in real wages becomes the pivotal variable leading to both expenditure effects and resource movement effects. The assumption that goods in the non-export sector are imperfect substitutes for imports grants the region a measure of local economic autonomy (Anderson 1991, 42).

The increase in incomes brought about by the higher wages leads to an increase in spending on both services and local manufactured products. The demand curve for labour shifts to the right in both the M and S sectors (D1 to D2 and D0 to D2). At the same time, the higher wages in the region attract migrants and the labour supply curve begins to shift to the right in all three sectors (S1 to S2). In the long run, wages will fall until they are equalized with wages in the rest of the country<sup>27</sup> (See Figure 2). The end result is an expansion of employment and output in all three sectors. (Total labour employed after the boom is equal to  $LG2 + LM2 + LS2$ ). Per capita incomes, however, will be the same as the rest of the country. As the area underneath the labour demand curves has increased in size, the income of the fixed factor, land, has increased. This model, therefore, predicts that the impact of the wheat boom on the region's economy would be to increase the overall size of the economy with per capita income levels relative to the rest of the country increasing in the short run but not the long run, with the exception of the income received by the fixed factor. The long-run contribution of the

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<sup>26</sup> Within the manufacturing sector there could occur a resource movement effect as labour moves out of goods being produced for local consumption and into the expanding grain production and transport oriented manufacturing industries. We assume that because of the inflow of labour from the service sector, there is no expansion in the overall size of the manufacturing sector.

<sup>27</sup> As wages fall, there will be a reverse expenditure effect but this is counteracted by the inflow of labour from outside the region which maintains demand for goods in the M and S sectors.

wheat boom to the region's economy, then, is in terms of extensive rather than intensive growth. The adjustment of per capita income to its long run equilibrium level after the boom explains why resource booms can be associated with declines in growth rates of per capita income.<sup>28</sup> The model also highlights that that the capitalization of the increased income to the local fixed factors into local asset values would be an indicator of the strength of development, or linkage capture. Thus, wealth can serve as the proxy for income and is in many ways a superior variable to income for our purposes, because it can capture the long term impacts of the effect of income over time on economic development. Moreover, the increase in real estate values can represent an attempt to capture the value of rent to land. This is the reason why we focus on estimates of average wealth over the period as an indicator of the effect of natural resource exports on development.

## **THE DATA**

The South Australian data are derived from probate and succession duty documents which are constructed after the death of an individual. Essential to the legal transfer of assets, these represent consistent, well-monitored information on personal wealth. Probate records contain papers filed to the court by the administrators of an estate including a copy of the testator's will, the executor's oath, correspondence with the court etc... The records contain information on the testator's name, address, occupation and a sworn estimate of gross wealth; but no list of assets, the age of the testator, and other family details. To obtain this information it was necessary to match the probate records with two other sources; the individual's death certificate and succession duty records. The death certificate contained information on the testator's age and cause of death as well as providing a cross check for recorded occupation. Between 1905 and 1915 the state levied succession duty on all estates and this process produced a succession file which contained a full inventory of the assets of the deceased, their heirs and the duty payable on each inheritance. The succession duty process required an independent appraiser estimate the market value of each individual piece of property,

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<sup>28</sup> For example, see Rodriguez and Sachs (1999).

which may include assets as trivial as salt and pepper shakers or as large as pastoral stations or manufacturing businesses.

Between 1905 and 1915, a total of 12,475 people were probated in South Australia. The top one percent of wealth leavers held approximately 30 percent of the wealth and the top 10 percent, 70 percent of the wealth. Such a distribution was similar to the distribution of wealth in New Zealand at the same period and to that of the United States in 1860. It was far more equal than the distribution of wealth in the United Kingdom at the same time where probate records suggest the top 1 percent held two-thirds of all wealth, and the top 10 percent held 90 percent of the wealth.<sup>29</sup>

For the purposes of constructing a data set from the probate data, four strata were selected. A one percent sample of estates between £0 and £500; a two percent sample for estates between £501 and £2500; a five percent sample of estates between £2501 and £20,000 and the complete population over £20,000. Records of a total of 337 individual estates were recorded but exact date of probate was only available for 307 of which two had negative net wealth leaving 305.

The Ontario data set was constructed from the probate records of the District of Thunder Bay Surrogate Courts from years 1885 to 1920. Prior to the Thunder Bay District's creation in 1885, the region's estates were probated in the District of Algoma. Under the *Surrogate Courts Act, 1858* (Statutes of Canada, 22 Vict., Cap. 93, 1858) a surrogate court with the power to issue grants of probate and administration valid throughout the province was established in each Ontario county, replacing the centralized Court of Probate established in 1793. The inventory was conducted by the executor of the estate (administrator in intestate cases) and legally needed only to be performed in response to a request by a legatee or creditor but in practice was brought in voluntarily without awaiting the compulsory summons.<sup>30</sup>

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<sup>29</sup> These comparisons, while all based on probate records, are fraught with danger given differences in the age structure, data coverage, estimation techniques etc. They should be regarded as indicative rather than exact. For a more complete discussion see Shanahan (1995). As a further example, estate multiplier estimates for Wentworth County, Ontario, between 1872 and 1902 show the top 10 percent of the distribution owned from 83 to 92 percent of the wealth. See Di Matteo and George (1992). For South Australia between 1905 and 1915, multiplier based estimates of wealth distribution suggest the top 10 percent held 70-80 percent of the wealth.

<sup>30</sup> According to Howell's *Law and practice*, pp. 325-326: "The inventory should contain a statement of all the goods, chattels, wares and merchandize, as well moveable as not moveable, which were of the person deceased at the time of his death within the jurisdiction of the court. A proper inventory should enumerate every item of which the personal estate consisted, and should specify the value of each particular. But unless by order of court, or in obedience to a

All estates bearing application dates in the years 1885 to 1920 were examined but only those 591 estates from 1905 to 1915 are used in this paper for comparison purposes. Variables recorded include place of residence, occupation, marital status, number of children, date of death, whether they had a will and the value of the estates. Unfortunately, age at death was not available in these probate records.<sup>31</sup> The inventory provided estimates of wealth grouped into 16 categories.<sup>32</sup> Like the Australian data an advantage of this data source is that there are separate estimates of real estate, financial assets and personal property over a substantial period of time.

### **AVERAGE WEALTH IN TBD AND SA, 1905 TO 1915**

Figures 3 and 4 compare median wealth levels and mean wealth levels in SA and Thunder Bay District for 1905 to 1915 and both indicate that probated decedents in SA had substantially higher levels of wealth. After converting the wealth in both data sets into U.S. dollars, the average wealth in South Australia probated decedents was roughly 15 times greater than that of probated decedents in the Thunder Bay District. SA wealth levels were higher than TB District in 1905 suggesting that much of that wealth was in place at the start of the period under study as opposed to accumulated over the period. One interpretation is that some of this initial difference in wealth levels reflects SA's development through its earlier copper, wool and wheat export periods in the nineteenth century. The higher wealth levels for South Australia reflect prolonged accumulation and growth over a longer period of time prior to 1905 as well as the possibility that more of the benefits of the wheat economy were retained relative to the Thunder Bay District. As

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citation, an inventory does not set forth the goods and chattels in detail." Probate instructions do not specify how asset value was assigned. For real estate, livestock and personal property the evidence suggests that it was market value. Sometimes, property was sold and its selling price recorded in the inventory, whereas more often it was an estimate of what the property would fetch if sold. Financial assets by their nature were precisely recorded. Mortgages held, the amount of insurance payments, and bank account balances were precise amounts. In addition, real estate was usually recorded net of any mortgages outstanding.

<sup>31</sup> Some data on age could be acquired by census-linkage but only three census years (1881, 1891, 1901) are currently available.

<sup>32</sup> The inventory categories were: (1) Household goods and furniture, (2) Farm implements, (3) Stock in trade, (4) Horses, (5) Cattle, (6) Sheep and Swine, (7) Book Debts and Promissory Notes, (8) Moneys secured by mortgage, (9) Life Insurance, (10) Bank stocks and other shares, (11) Securities, (12) Cash on hand, (13) Cash in bank (14) Farm produce, (15) Real estate, (16) Other personal property. For further discussion of probate records used in Ontario 1892 data, see Di Matteo, "*Determinants of wealth*", "*Wealth accumulation*" and Di Matteo and George, "*Wealth inequality*", "*Patterns and determinants*". For an evaluation of probate sources, see Elliot, "*Sources of bias*", Osborne, "*Wills and inventories*" and Wagg, "*Bias of probate*".

well, there was inflation in asset values in Australia in the late 19<sup>th</sup> century that could also explain substantially higher levels of wealth. (See Bentick, 1969 and McLean 1994). The values of these assets increased 1870-1890; fell somewhat to the mid 1890s but had high levels by 1905.<sup>33</sup> In addition, some of the difference in wealth levels could also be ascribed to differences in ages across the two regions. The Thunder Bay region was newly settled and therefore likely had a younger average age than South Australia.

The higher overall levels of wealth of South Australia could be ascribed to endowments, linkage effects and timing. A comparison of the changes in wealth levels across the two economies over 1905 to 1915 can allow us to identify the conditions and factors that result in natural resource exports developing an economy. If SA's capacity to accumulate wealth exceeds that of Thunder Bay over 1905 to 1915, then the reasons for successful resource export based development are to be found in factors specific to SA, such as its coastal ports. On the other hand, if there is no difference between the capacities to accumulate wealth across the two economies over the same period, then the reasons for successful resource export based development are to be found in factors specific to the earlier period, when Ontario also successfully developed through wheat exports.

As mentioned above, one of the difficulties that we have encountered in assessing the change in average wealth levels are the relatively high values for SA wealth in 1908 and 1911, which we believe could also partly be the result of having relatively fewer observations for the SA sample in some years. Figures 5 and 6 plot LOWESS smoothes of the value of real wealth in South Australia and Thunder Bay District.<sup>34</sup> The LOWESS smoothes help deal with the impact of extreme observations in assessing the wealth profile over time. These Figures suggest that this boom period for both economies reached a peak in 1913. In terms of the booming sector model described

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<sup>33</sup> Another possibility is that differences in extraction methods have resulted in quite different samples being taken from the probate records. For Thunder Bay district, all estates probated between 1905 and 1915 have been included. In the case of South Australia, we have a stratified random sample being used. While selecting estates over 20000 pounds, the process also identified those leaving little wealth. While there may be differences in the proportion of estates of different sizes between the two samples, there is no obvious bias of either data set to its relative population.

<sup>34</sup> For South Australia, the CPI index with 1939=100 (Source: Mitchell) was used while the Altman adjusted Urquhart Index was used for the Thunder Bay data. Not all of the South Australian data had a year date and therefore the size of the data set was reduced to n=304.

earlier, the decline in wealth after 1913 can be ascribed to the adjustment to post-boom equilibrium. Figure 7 further adjusts for the impact of outliers on wealth by removing the top and bottom estate and recalculating the average for each year and then normalizes the annual value by the average for 1905 to 1915 for the regional economy. This figure suggests that the changes in wealth levels over the period, particularly from 1905 to the peak value in 1913, are the same.

Table 1 shows the proportion of probated decedents reporting financial assets and real estate across the two regions. The differences in the proportion reporting real estate ownership were much smaller across the two regions whereas there is a very large gap in financial asset ownership. Figure 8 shows the value of real estate in each year normalized by the average value of real estate for the period 1905 to 1915. This figure suggests that the value of “local assets” in the two economies had common changes. The common changes in real estate ownership trends and values and the greater importance of financial wealth for the South Australian decedents suggests that members of the South Australian small open economy by 1905 had the potential to be capital exporters.<sup>35</sup> The importance of financial assets in the portfolio would also suggest that SA is an example of what needs to happen for resource exports to generate sustainable income levels according to Rodriguez and Sachs (1999).

The fact that the increase in average wealth was common to both economies despite the much greater level of grain trade activity in TBD suggests that there are features of the SA economy that allowed it to capture a greater share of the economic rents/linkages associated with the rural economy. We also suspect, following McCallum (1980) that these characteristics are shared with Southern Ontario from 1840 to 1870. Three potential explanations need to be considered. First is the coastal location of the Port of Adelaide compared to the inland entrepot location of TBD. To the extent that total resource costs of transporting grain to market were lower in SA than from the prairie grain economy, there was more surplus to be captured by producers and transporters. Second, it may be important who captured the surplus and how they captured it. We characterize this latter point as a modification of a Stolper-Samuelson theorem argument where a relative increase in the price of a commodity will increase the

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<sup>35</sup> See McLean (1994) Figure 4.

real return to the factor used intensively in that industry and reduce the real return to the other factor, but where that increase in real return ultimately remains depends on the location of the owner of the factor of production.

To demonstrate the reasons for South Australia's ability to generate the same average change in wealth as the Thunder Bay District despite having total bushels of wheat produced that represented at most 4 percent of total bushels of wheat shipped through the Lakehead, we provide the following exercise. The role of the Thunder Bay District in the Canadian Grain trade was to handle enormous quantities of grain arriving by rail from western Canada. The grain was transferred from rail cars, weighed, inspected, and stored in terminal elevators before being transferred to a lake freighter. The costs of doing these functions were likely on the order of 1.5 to 2 cents per bushel.<sup>36</sup> As much of the elevator capacity at the Lakehead (80 percent in 1905 and 60 percent in 1915) was owned by the railways, a large portion of this income would not have been retained by the Lakehead region. Only the Paterson Elevators had its private owners based in the Lakehead. In addition, the income of farmers from wheat production would accrue to the prairie provinces, not TBD. The income earned by the railways that brought the grain to the Lakehead, other than the wage payments to locally based employees, would accrue to the location of the railway's head office in the east of the country as would the income earned by the companies that owned the ships that plied the great lakes. We estimate the income from the wheat activities at the Lakehead District as the number of bushels of wheat shipped from the Lakehead each year shown in Figure 9, by 1.5 cents per bushel for 1905 to 1915.

For the South Australian economy, we are looking at a situation where production, transportation to the ocean port and handling were all carried out in the SA economy. As we noted earlier, the SA rail network was state owned. Under the strong assumption that the income for these activities was completely captured by local producers, shippers and handlers, we approximate the income from a bushel of wheat for the South Australian economy by the price of wheat in England less the cost of ocean transportation from Australia. The average market price of an Imperial Bushel of wheat

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<sup>36</sup> Based on estimated costs of moving a bushel of wheat from Saskatchewan to Liverpool in 1925, Plate 19, "The Grain Handling System", Historical Atlas of Canada. Rutter 1911 provides a similar estimate for 1900-1910.

at Pt. Adelaide was 0.19 of a Pound for 1905 to 1914.<sup>37</sup> If we value the pound in US dollars (an average of approximately 4.85 over the years 1905-1915), the price per bushel of wheat was roughly equivalent to 90 cents. The total wheat income for South Australia is thus approximated as the annual number of bushels of wheat produced time 90 cents per bushel.<sup>38</sup>

Figure 10 demonstrates that despite a vast difference in quantities of grain produced, transported and traded, wheat exports generated substantially higher income in SA than TBD before 1910, and the convergence in grain trade incomes only takes place after 1910 when grain shipments through the Lakehead increased substantially. Our estimates of wheat incomes for the two economies provide a clear explanation for the higher average wealth levels in SA relative to TBD, and the changes in wheat incomes generally reflect the changes we demonstrate in average wealth in the two economies over 1905 to 1915. For the Thunder Bay District, this estimated income from the wheat trade shows the same approximate pattern as the average wealth estimates in Figure 7.

This comparison highlights key determinants for successful development from the export of natural resources; the ability to retain linkages associated with the resource exports. One way to think of our comparison of these two wheat exporting economies is that South Australia represents an economy where transportation, production and handling of wheat is carried out by local owners of capital so that capital's share of income is retained locally. Thunder Bay District in contrast, is akin to a resource exporting country where production and transportation functions are controlled by external capital and that income does not remain in the local economy. While wheat exports would have increased the incomes of farmers, transportation companies and other sectors across Canada, the regional benefits of the grain trade would have been distributed according to the home address of the head offices and the owners of capital.

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<sup>37</sup> The price of wheat in Port Adelaide was 0.33 of a Pound in 1915, substantially higher than any other price over the period. The average price of a bushel of wheat in Port Adelaide is 0.2 of a Pound if this 1915 observation is included.

<sup>38</sup> The issue of the level of freight rates or prices received by farmers is not relevant to this calculation so long as wheat production is not too supply elastic. Those rates and prices pertain to the distribution of the wheat income across activities and agents involved in the production and trade of wheat. So long as all of these agents reside in the domestic economy, then the price of wheat at the port represents the income per unit of quantity for the domestic economy.



As a consequence, much of the income and wealth generated by the resource exports did little for the TBD economy.

Our comparison suggests that an understanding of the apparent poor performance of resource abundant economies has little to do with intrinsic properties of natural resources and more to do with the sources and ownership of capital used to produce and transport the natural resources to market. Oil producing nations would be least likely to succeed given the combination of capital intensive production and transportation of the commodity along with the traditional reliance on external (most often US) capital.

### **CONCLUDING REMARKS**

In this paper, we find that natural resources can provide a successful framework for successful economic development in both the short run and the long run. The wheat boom of the early twentieth century led to similar changes in wealth in the Thunder Bay District and in South Australia suggesting successful short term impacts of the wheat boom across regions. At the same time, the level of wealth was substantially higher in South Australia than the Thunder Bay District suggesting that the wheat boom certainly generated successful long-term economic development in South Australia.

There are important differences between the two regions. South Australia benefited from earlier resource export episodes, including copper in the 1840s, wheat and wool in the 1850s and wheat again in the 1870s whereas in 1905, the Lakehead was really a new economy. Adelaide SA is a coastal port that, for much of the latter nineteenth century was a direct gateway to the world grain market, whereas the Port Arthur/Fort William port was an intermediate terminus on the Canadian transportation system, as grain would have to have been transferred from Great Lakes Freighters to ocean going vessels on the way to market. Adelaide managed to maintain more of a hold on its hinterland region than did the Lakehead, which faced substantial competition from other ports. Nevertheless, the Lakehead experienced similar growth rates in wealth because of the much higher volume of grain produced in Canada and shipped through the Lakehead relative to Adelaide,

While average wealth levels in SA were substantially higher in SA than in TBD, between 1905-1915, the increase in average wealth levels was equivalent in SA and the

Lakehead district. The volume of wheat passing through the Lakehead was substantially greater than that produced in SA but SA was able to appropriate more linkages from grain production. The higher wealth levels in SA relative to the TBD during the 1905-1915 period is rooted in the fact that SA was a region of older settlement and over time earlier wealth accumulation was able to compound into higher levels relative to the more newly settled TBD. Long term economic development from natural resources is therefore a function of the ability to retain linkages from the resource activity as well as the passage of time necessary for linkages to develop and wealth to accumulate. The failure of the Thunder Bay District by the late twentieth century to successfully develop self-sustaining long run economic growth and export capital as South Australia began to do in the early twentieth century is rooted in the key differences in linkage generation and retention between the two regions. The key to capturing the linkages from natural resource production is to eventually generate domestic sources of capital rather than rely on external sources of capital.

## REFERENCES

- Anderson, F.J. (1991) "Regional trade and adjustment with expenditure effects." *Canadian Journal of Regional Science* XIV: 23-46.
- Anderson, F.J. (1988) *Regional Economic Analysis A Canadian Perspective*. Toronto: Harcourt Brace Jovanovich.
- Auty, Richard M. (2001) "The Political Economy of Resource-Driven Growth," *European Economic Review* 45 (4-6), 839-846.
- Baldwin, R.E. (1956) "Patterns of development in newly settled regions." *Manchester School of Economic and Social Studies* XXIV: 161-179.
- Bentick, B.L. (1969) "Foreign borrowing and wealth consumption: Victoria 1873-93," *Economic Record*, 45(111), 415-431.
- Bertram, G.W. (1973) "The relevance of the wheat boom in Canadian economic growth." *Canadian Journal of Economics* VI: 545-566.
- Buckley, K.A.H. (1958) "The role of staple industries in Canada's economic development." *The Journal of Economic History* 18: 439-450.
- Butlin N.G., (1964)[1976] *Investment in Australian Economic Development 1861-1900*, Department of Economic History, ANU. Canberra.
- Callender, G.S. (1902) "The early transportation and banking enterprises of the states in relation to the growth of corporations." *Quarterly Journal of Economics* XVII: 111-162.
- Callender, G.S. (1965[1909]) *Selections from the economic history of the United States, 1765-1860*. New York: Augustus M. Kelley.
- Caves, R.E. (1966) "'Vent for surplus' models of trade and growth," in Baldwin et al., *Trade, growth and the balance of payments: Essays in honor of Gottfried Haberler*. Chicago: Rand McNally: 95-115.
- Caves, R.E. (1971) "Export-led growth and the new economic history," in Bhagwati et al., (eds.) *Trade, Balance of Payments and Growth*. Amsterdam: North Holland: 403-442
- Chambers, E.J. and D.F. Gordon (1966) "Primary products and economic growth: An empirical measurement." *Journal of Political Economy* 74: 315-331.
- Corden, W.M. and J.P. Neary (1982) "Booming sector and de-industrialization in a small open economy." *Economic Journal* 92: 825-848.
- Corden, W.M. (1983) "The economic effects of a booming sector." *International Social Science Journal* 35: 441-454.
- Crafts, Nicholas (2004) "Globalisation and Economic Growth: A Historical Perspective," *World Economy* 45-58
- Dales, J.H., J.C. McManus and M. Watkins (1967) "Primary products and economic growth: A comment." *Journal of Political Economy* 75: 876-880.
- Di Matteo, L. (1991) "The economic development of the Lakehead during the wheat boom era:1900-1914." *Ontario History* LXXXIII: 297-316.
- Di Matteo, L. (1992) "Evidence on Lakehead economic activity from the Fort William building permit registers, 1907-1969." *Papers and Records, Thunder Bay Historical Museum Society* XX: 37-49.

- Di Matteo, L. (1993) "Booming Sector Models, Economic Base Analysis, and Export-Led Development: Regional Evidence from the Lakehead." *Social Science History*, 17,4,593-617.
- Di Matteo, L. and P. George (1992) "Canadian wealth Inequality in the Late Nineteenth Century: A Study of Wentworth County Ontario, 1872-1902," *Canadian Historical Review*, 73,4, 453-483.
- Dunsdorfs, E. (1956) *The Australian wheat-growing industry 1788-1948*. The University Press, Melbourne.
- Fogarty, J. (1988) "Economic history and the limits of staple theory." in T. Crowley (ed.) *Clio's Craft*. Toronto: Copp Clark Pitman: 179-194.
- Fowke, V.C. (1971[1957]) *The National Policy and the Wheat Economy*. Toronto: University of Toronto Press.
- Gallup, John Luke, Jeffrey D. Sachs and Andrew D. Mellinger (1998) "Geography and Economic Development," NBER Working Paper Series, Working Paper 6849.
- Hirst, J.B., (1973) *Adelaide and the Country 1870-1917. Their Social and Political Relationship*, Melbourne: Melbourne University Press
- Harley, C.K. (1986) "Resources and economic development in historical perspective", in David Laidler (ed.) *Responses to Economic Change, Royal Commission on the Economic Union and Development Prospects for Canada, Vol. 27* (1-32). Toronto: University of Toronto Press.
- Harley, C. Knick (1980) "Transportation, the World Wheat Trade, and the Kuznets Cycle, 1850-1913," *Explorations in Economic History* 17, 218-250.
- Harley, C. Knick (1978) "Western Settlement and the Price of Wheat, 1872-1913," *Journal of Economic History* 38(4), 865-878.
- Howell, A. (1880) *The Law and Practice as to Probate, Administration and Guardianship in Surrogate Courts*. Toronto: Carswell.
- Hughes, Johnathan and Louis P. Cain. *American Economic History* Fourth Edition. New York: Harper Collins, 1994.
- Innis, H.A. (1984[1930]) *The Fur Trade in Canada: An Introduction to Canadian Economic History*. Toronto: University of Toronto Press.
- Innis, H.A. (1978[1940]) *The Cod Fisheries: The History of an International Economy*. Toronto: University of Toronto Press.
- Innis, H.A. (1969[1956]) *Essays in Canadian Economic History*. Mary Q. Innis (ed.) Toronto: University of Toronto Press.
- Kerr, Donald and Deryck W. Holdsworth eds. *Historical Atlas of Canada, Volume III: Addressing the Twentieth Century 1891-1961* (Toronto: University of Toronto Press, 1990).
- Leacy, F.H. (1982) *Historical Statistics of Canada, Second Edition* (Ottawa: Statistics Canada).
- Lewis, F. (1975) "The Canadian wheat boom and per capita income new estimates." *Journal of Political Economy* 83: 1249-57.
- McCallum, J. (1980) *Unequal Beginnings: Agricultural and Economic Development in Quebec and Ontario until 1870*, Toronto: University of Toronto Press.
- MacGibbon, D.A. (1932) *The Canadian Grain Trade*. Toronto: MacMillan Co.
- Mackintosh, W.A. (1923) "Economic factors in Canadian history." *The Canadian Historical Review* IV: 12-25.

- Maddison, A., (1995) *Monitoring the World Economy 1820-1992*, Paris, OECD.
- McLean I., (2004) *Australian economic growth in historical perspective*. School of Economics Working Paper 2004-01, The University of Adelaide.
- McLean I., and Pincus J.J. (1983) Did Australian living standards stagnate between 1890 and 1940? *Journal of Economic History* 43:1 (March) 193-202.
- McLean, I. (1994) "Saving in Settler Economies: Australian and North American Comparisons," *Explorations in Economic History* 31(4), 432-452.
- Meinig, D.W. (1962) *On the Margins of the Good Earth: The South Australian Wheat Frontier 1869-1884* (London: John Murray).
- Mitchell, B. (2003) *International Historical Statistics: Africa, Asia and Oceania 1750-2000* (4th edition) (McMillan).
- Osborne, B.S. (1980) "Wills and inventories: Records of life and death in a developing society," *Families*, 19, 4, 235-247.
- Pomfret, R. (1981) "The staple theory as an approach to Canadian and Australian economic development." *Australian Economic History Review* XXI: 133-146.
- Pomfret, R. (2000) "Trade policy in Canada and Australia in the twentieth century." *Australian Economic History Review* 40:2: 114-126.
- Rappaport, Jordan and Jeffrey D. Sachs (2003) "The United States as a Coastal Nation," *Journal of Economic Growth* 8, 5-46.
- Rodriguez, Francisco and Jeffrey D. Sachs (1999) "Why do resource abundant economies grow more slowly?" *Journal of Economic Growth* 4(3), 277-303.
- Rutter, W.P. (1911) *Wheat Growing in Canada, the United States & the Argentine* (London: Adam and Charles Black).
- Sachs, J.D. and A.M. Warner (2001) "Natural Resources and Economic Development: The curse of Natural Resources," *European Economic Review*, 45, 827-838.
- Sachs, J.D. and A.M. Warner (1999) "The big Push, Natural Resource Booms and Growth," *Journal of Development Economics*, 59, 43-76.
- Sachs, Jeffery D., and Andrew M. Warner, "Natural resource abundance and economic growth," NBER Working Paper 5398, (December 1995) 54 p.
- Shanahan, M.P. (1995) "The distribution of personal wealth in South Australia 1905-1915" *Australian Economic History Review* (September) XXXV: 2, 1995: 82-111.
- Stafford, J. (1995) "A Century of Growth at the Lakehead" in T. Tronrud and A.E. Epp, eds. *Thunder Bay: From rivalry to unity* (Thunder Bay: Thunder Bay Historical Museum Society)
- Stevenson, T. (1986) 'Population Statistics'. In Vamplew W., Richards E., Jaensch D., and J.Hancock (eds.) *South Australian Historical Statistics*, Monograph No 3, University of New South Wales Sydney.
- Urquhart, M.C. (1986) "New estimates of gross national product, Canada, 1870-1926: Some implications for Canadian development." in S.L. Engerman and R.E. Gallman (eds.) *NBER Studies in Income and Wealth vol. 51: Long Term Factors in American Economic Growth*. Chicago: University of Chicago Press: 9-94.
- Vamplew W., Richards E., Jaensch D., and Hancock J. (1988) *South Australian Historical Statistics*, Historical Statistics Monograph No 3. University of New South Wales History Project Incorporated.
- Vamplew W. (ed.), (1987) *Australians. Historical Statistics*, Fairfax, Syme & Weldon Associates, Sydney.

- Wagg, P. (1990) "The bias of Probate: Using Deeds to Transfer Estates in Nineteenth-Century Nova Scotia," *Nova Scotia Historical Review*, 10, 1, 74-87.
- Watkins, M.H. (1963) "A staple theory of economic growth." *Canadian Journal of Economics and Political Science* XXIX: 141-158.

**TABLE 1**  
**ASSET HOLDING PROPORTIONS**

<b>Year</b>	<b>Real Estate</b>		<b>Financial Assets</b>	
	<b>S. Aust</b>	<b>T. Bay</b>	<b>S. Aust</b>	<b>T. Bay</b>
1905	0.68	0.87	0.92	0.73
1906	0.85	0.58	0.94	0.67
1907	0.72	0.59	0.84	0.77
1908	0.75	0.62	0.96	0.81
1909	0.79	0.76	0.95	0.71
1910	0.73	0.70	0.95	0.66
1911	0.83	0.72	0.97	0.53
1912	0.82	0.69	0.95	0.64
1913	0.74	0.69	0.97	0.64
1914	0.84	0.74	1.00	0.69
1915	1.00	0.81	0.83	0.68
Average	0.79	0.70	0.95	0.67

**SOURCE: PROBATE RECORDS (SEE TEXT).**

**TABLE 2: WHEAT PRODUCTION IN SOUTH AUSTRALIA AND CANADA**

<b>Year</b>	<b>AREA UNDER WHEAT (ACRES)</b>		
	<b>SA</b>	<b>Australia</b>	<b>Canada</b>
1870	604761	1123839	1647000
1880	1733542	3052617	2367000
1890	1673573	3228535	2701000
1900	1913247	5666614	4225000
1910	2104719	7372456	8865000
1915	2739214	12484512	15109000

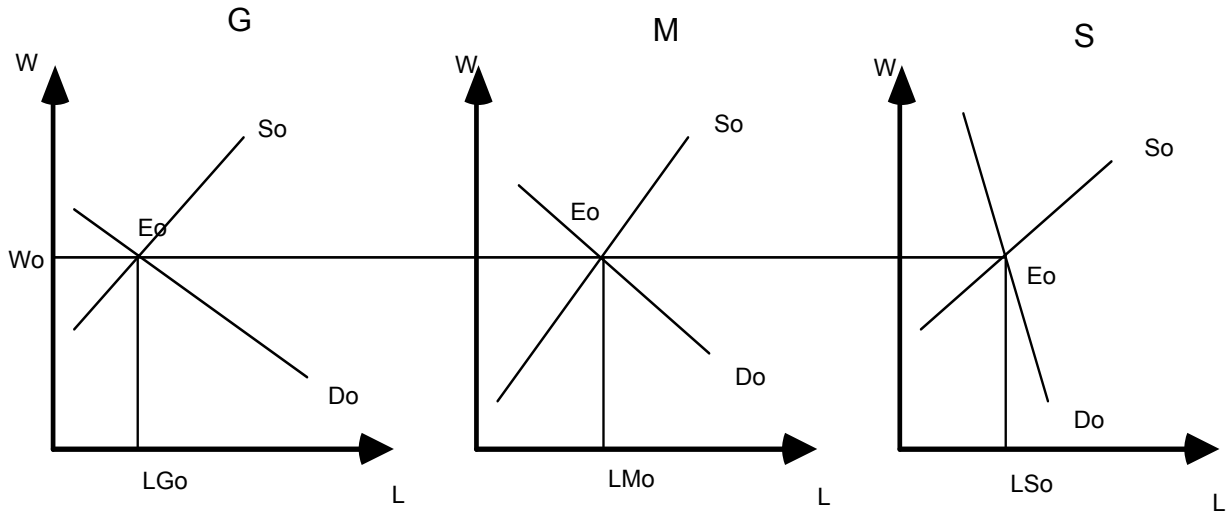
<b>Year</b>	<b>WHEAT PRODUCTION (BUSHEL PER ACRE)</b>	
	<b>SA</b>	<b>Canada</b>
1870	11.50	10.20
1880	5.00	13.70
1890	5.60	15.60
1900	5.90	13.20
1910	11.60	14.90
1915	12.50	26.00

**SOURCE: CANADA-HISTORICAL STATISTICS OF CANADA  
DUNSDORFS (1956) APPENDIX; VAMPLEW ET AL (1987) AG46-54.**



**FIGURE 1**

**PRE-BOOM EQUILIBRIUM**



**FIGURE 2**

**BOOM, ADJUSTMENT AND POST-BOOM EQUILIBRIUM**

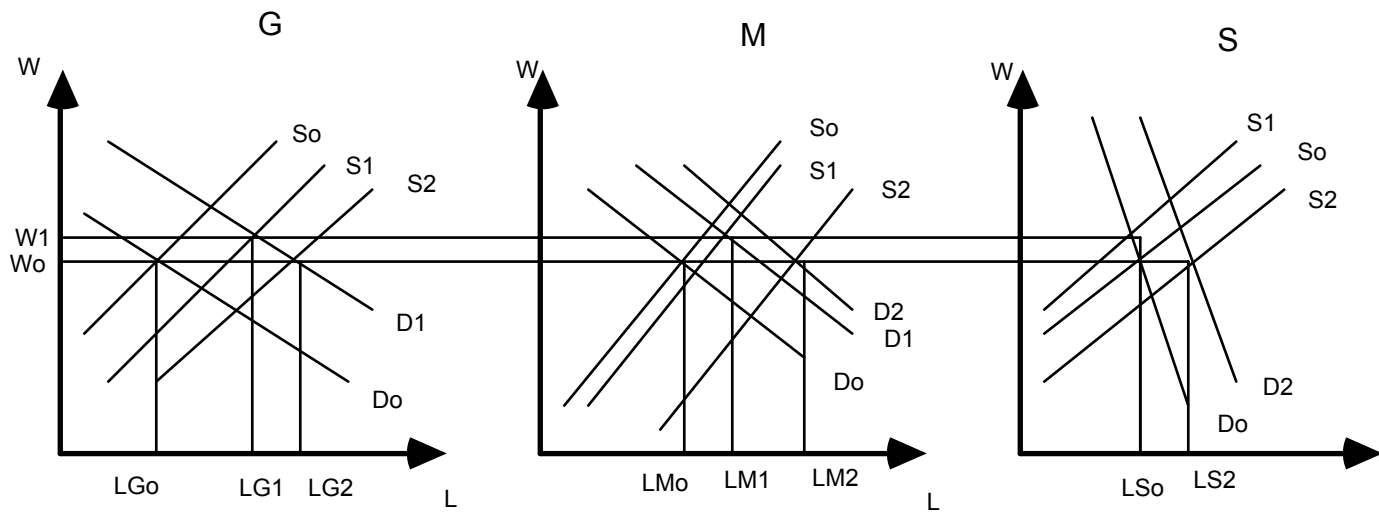
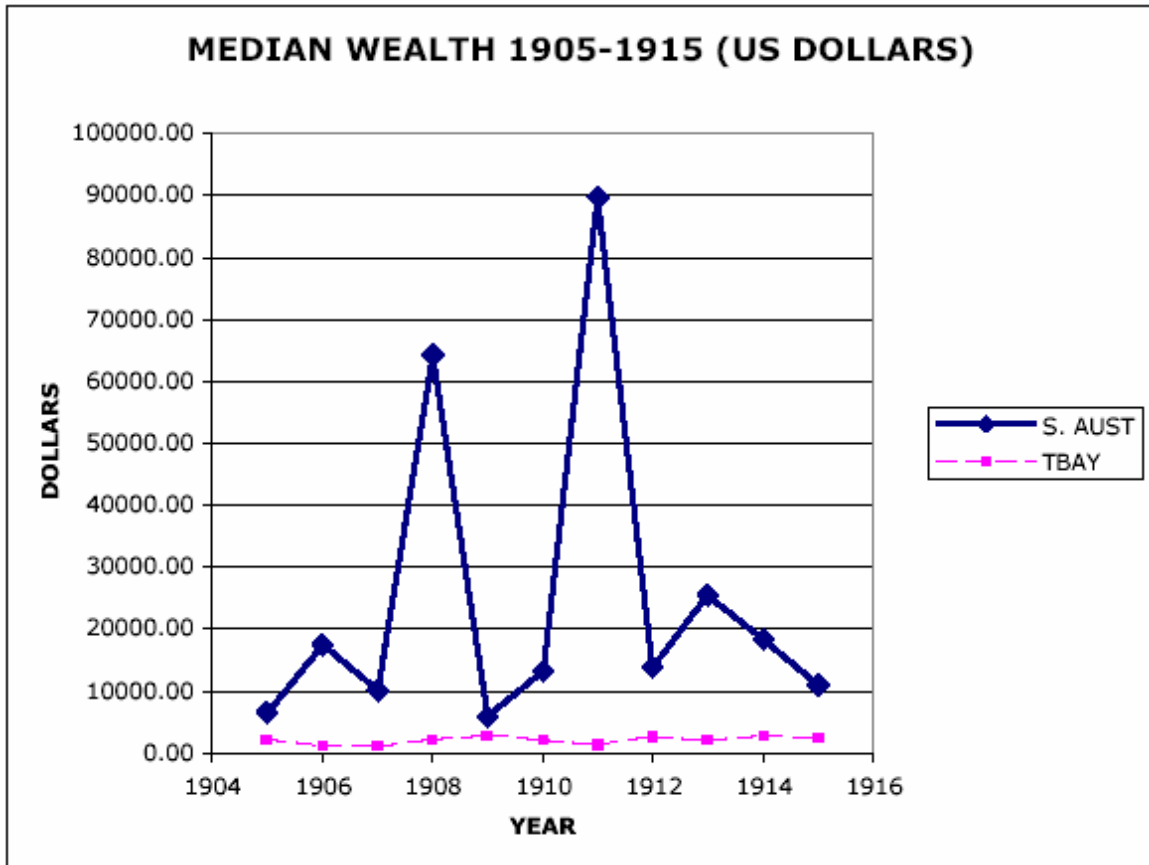
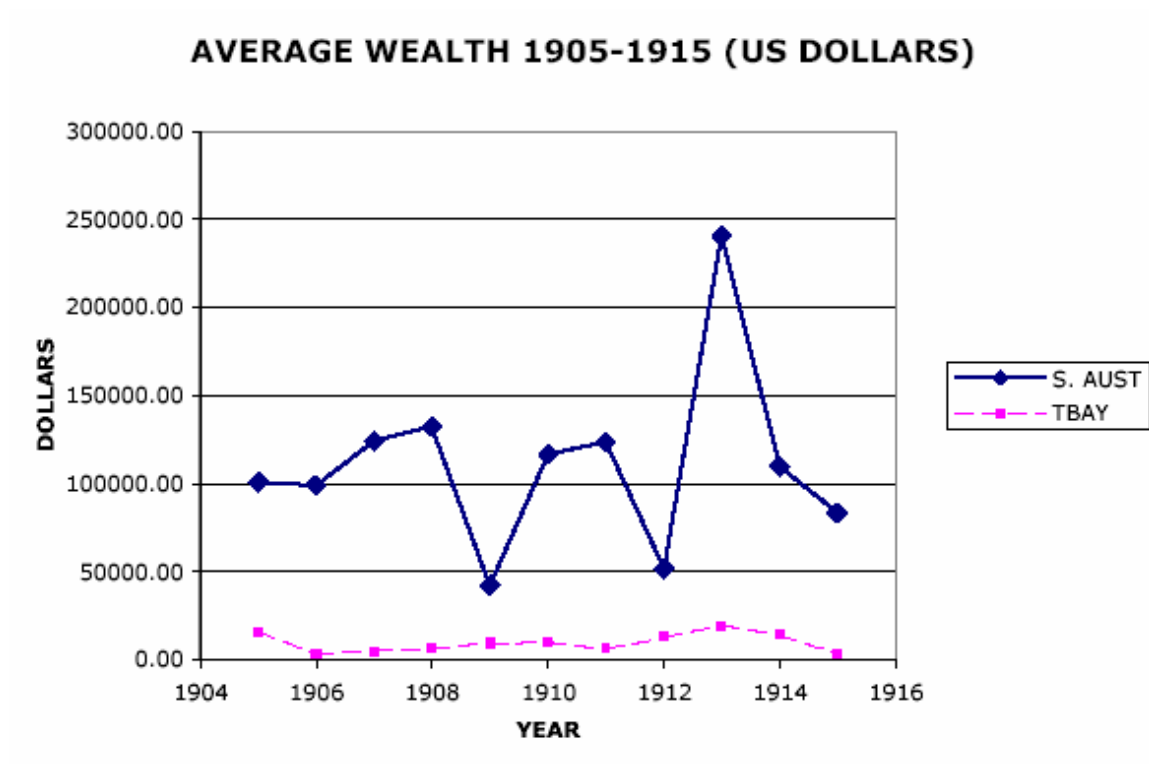


FIGURE 3



SOURCE: PROBATE RECORDS (SEE TEXT).

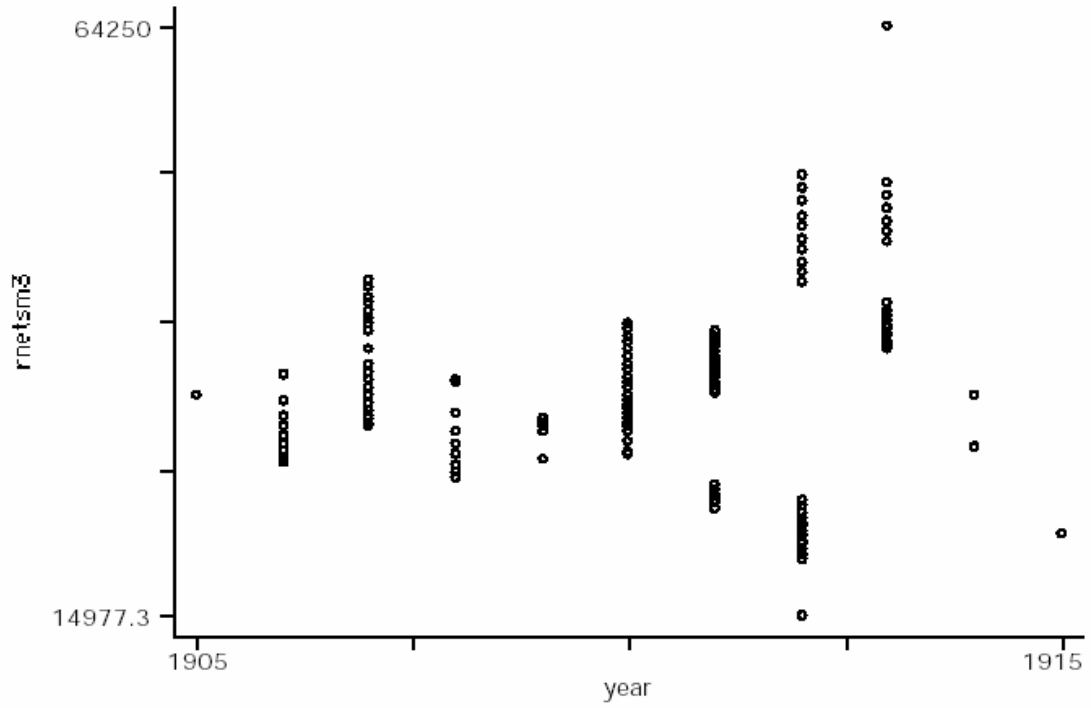
**FIGURE 4**



**SOURCE: PROBATE RECORDS (SEE TEXT).**

**FIGURE 5**

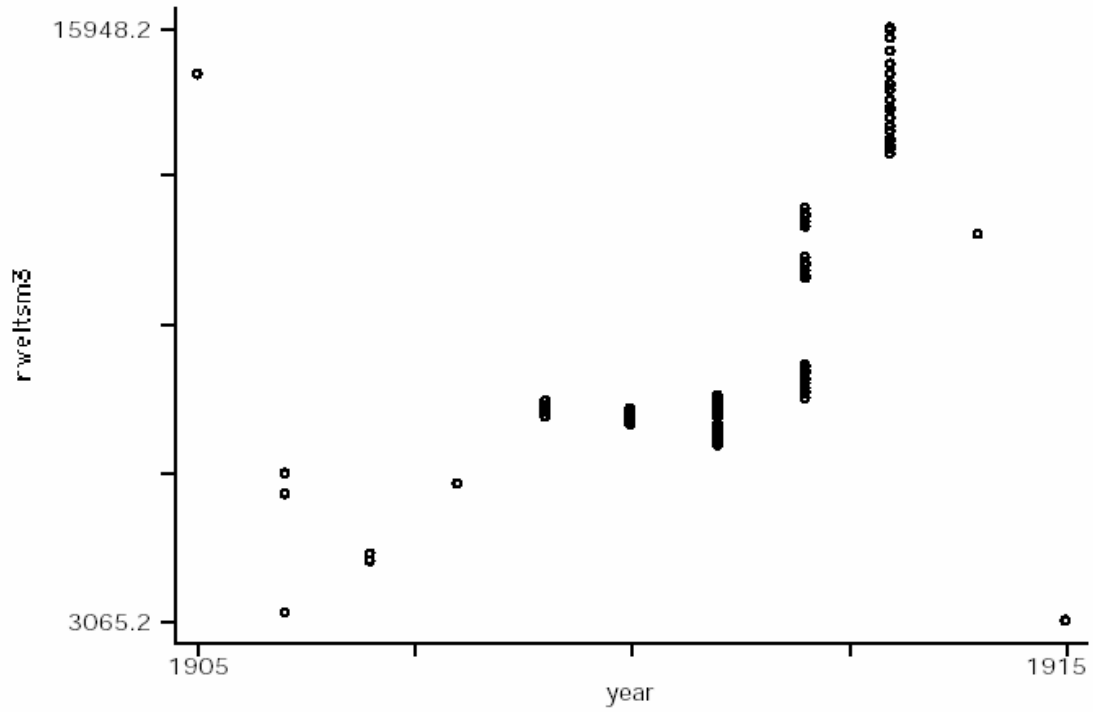
**SOUTH AUSTRALIAN REAL OFFICIAL NET WEALTH (1938=100, pound sterling) VERSUS YEAR-LOWESS SMOOTH(BANDWIDTH=0.3) (n=304)**



**SOURCE: PROBATE RECORDS (SEE TEXT).**

**FIGURE 6**

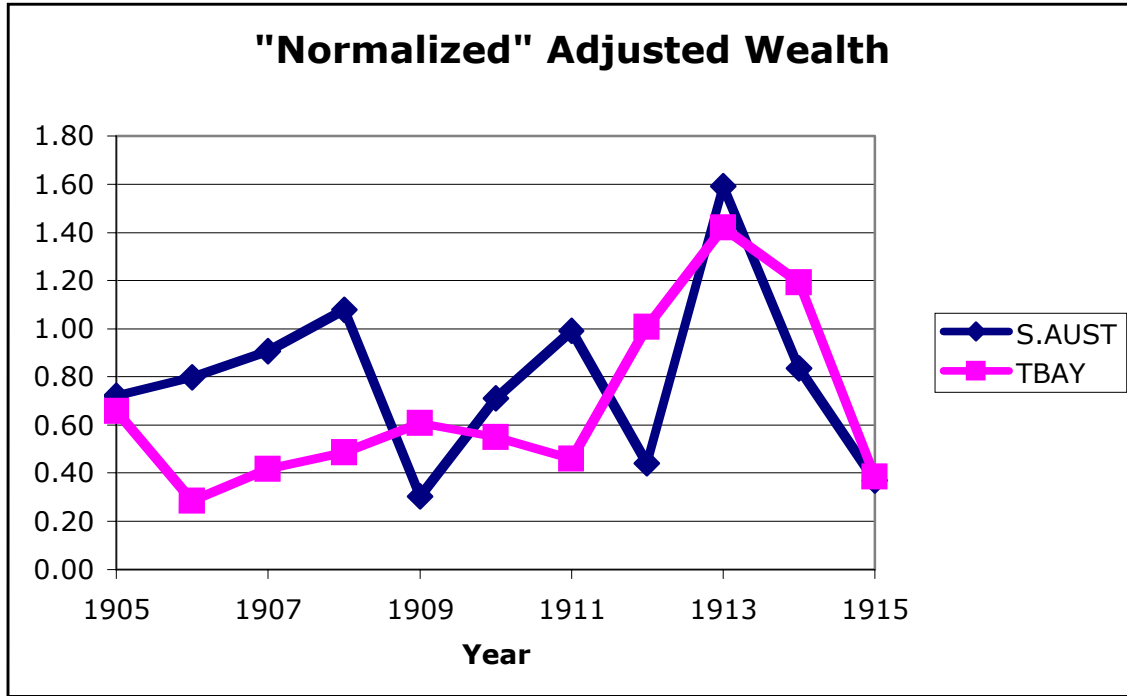
**THUNDER BAY DISTRICT REAL WEALTH (1900=100, dollars) VERSUS  
YEAR-LOWESS SMOOTH(BANDWIDTH=0.3) (n=591)**



**SOURCE: PROBATE RECORDS (SEE TEXT).**

**FIGURE 7**

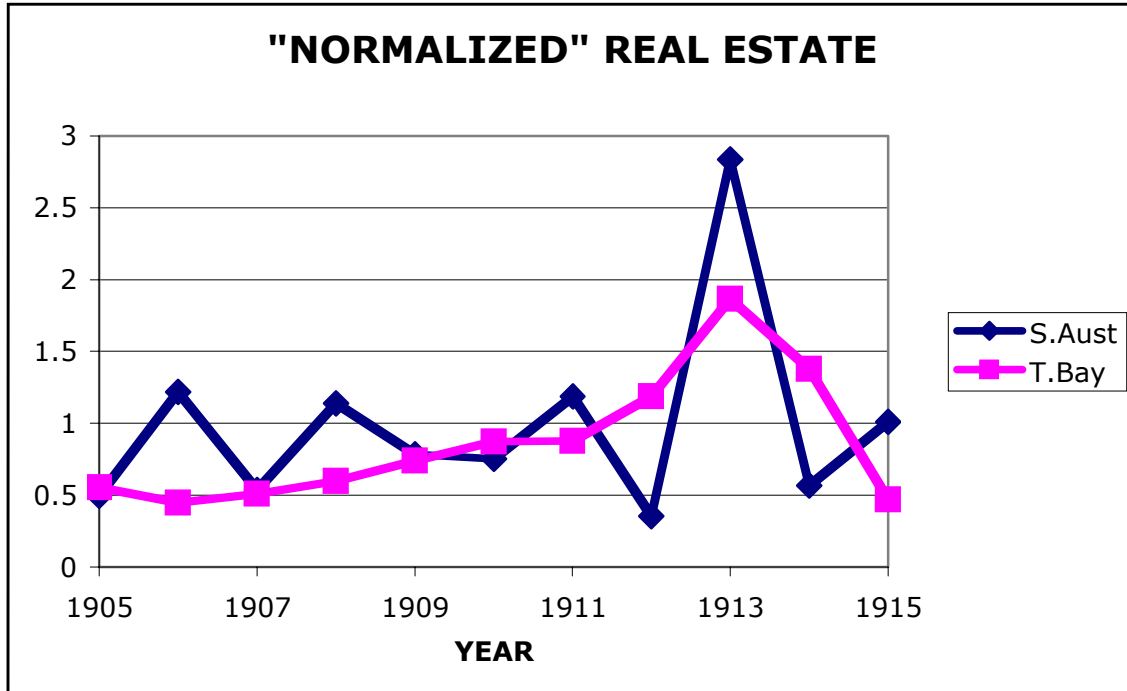
**COMPARISON OF NORMALIZED WEALTH AFTER ADJUSTING FOR EXTREME OBSERVATIONS EACH YEAR\***



\*BOTTOM AND TOP ESTATE DROPPED FOR EACH YEAR TO ESTIMATE AN OUTLIER ADJUSTED AVERAGE WEALTH FOR EACH YEAR. THIS IS NORMALIZED BY THEN DIVIDING EACH YEAR BY THE AVERAGE FOR THE WHOLE 1905-1915 PERIOD.

SOURCE: PROBATE RECORDS (SEE TEXT).

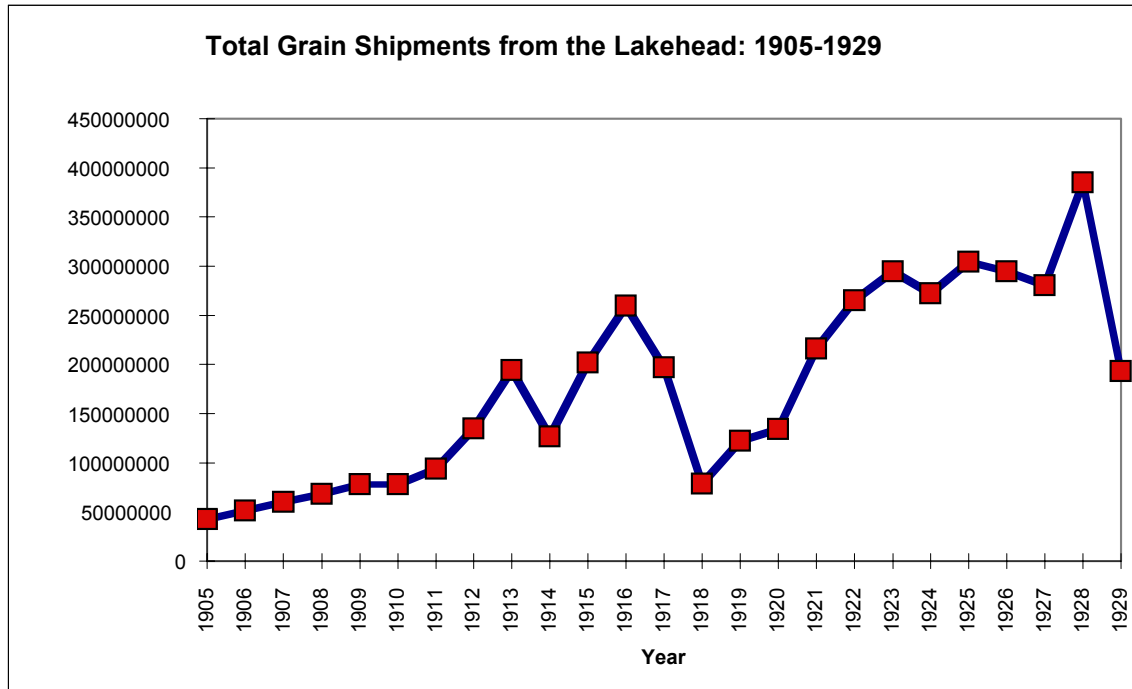
**FIGURE 8**  
**COMPARISON OF NORMALIZED\* REAL ESTATE**



\* NORMALIZED BY DIVIDING EACH YEAR BY THE AVERAGE FOR THE WHOLE 1905-1915 PERIOD.

SOURCE: PROBATE RECORDS (SEE TEXT).

**FIGURE 9**

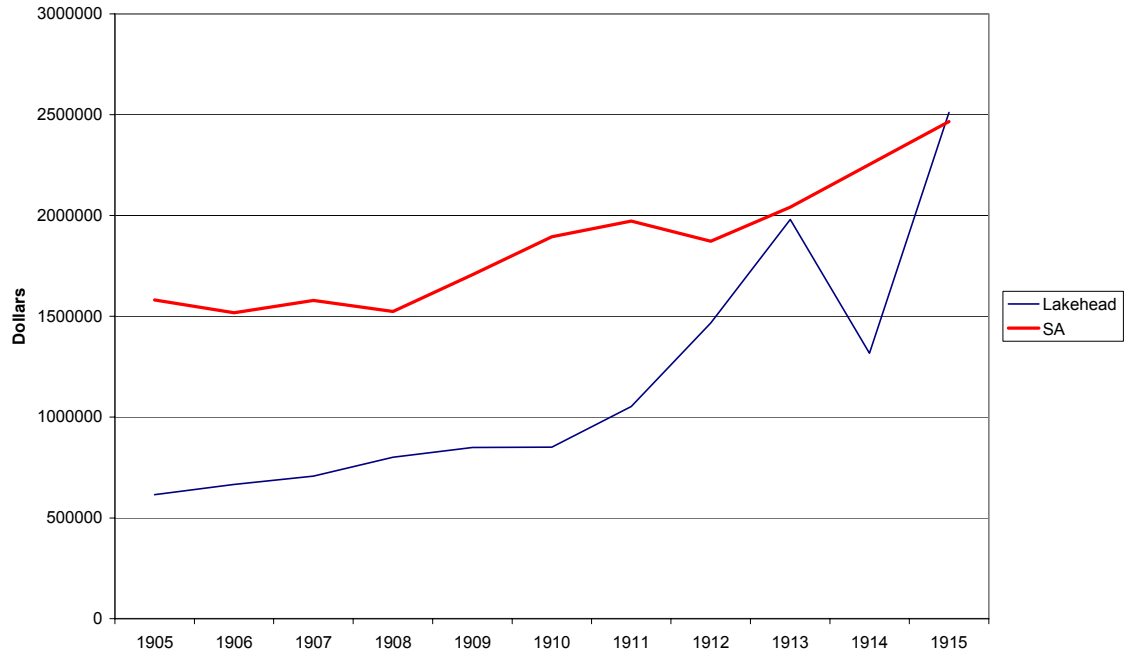


Source: Canal Statistics, Department of Railways and Canals and Dominion bureau of Statistics, Statistics Canada, 54-201 (1919-1931); Canada Year book (pre 1919).



**FIGURE 10**

**Estimated Gross Incomes From Wheat Production, Transportation and Trade, The Lakehead and South Australia, 1905-1915**



**SOURCE: AUTHORS CALCULATIONS (SEE TEXT)**