

Canada and Kazakhstan may seem like they are far apart, separated by oceans on opposite sides of the world. But our countries have much in common, and our societies have many shared experiences. These similarities make us natural partners in a globalized, globally competitive world. They give us a solid foundation for partnership that will create better futures for our people and the world.

The Canada in Kazakhstan conference, organized by the Embassy of Canada to Kazakhstan in partnership with the Library of the First President of Kazakhstan, created a forum where students and academics can discuss, debate, and generate ideas for further collaboration between Canada and Kazakhstan. Students, faculty, and independent scholars were invited to submit papers on this topic.

The following is the **2<sup>nd</sup> place paper**:

## **WHAT KAZAKHSTAN COULD LEARN FROM ALBERTA'S DIVERSIFICATION POLICIES: ISSUES, BEST PRACTICES, AND RECOMMENDATIONS**

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## ABSTRACT

The purpose of this article is to critically evaluate Alberta's diversification policies since 1974 and provide recommendations aimed at improving Kazakhstan's diversification initiatives. The analysis in this article is based on the analysis of academic papers, government publications, and reports from international organizations. Evidence from Alberta suggests that diversification policy should, where possible, complement rather than counteract market forces. Specifically, policies should focus on broadening and expanding industries within the sectors in which Kazakhstan enjoys a comparative advantage (i.e., the mineral resource sector, the agricultural sector, and the transportation sector) rather than change the country's economic base. Furthermore, diversification strategies should i) limit the number of vertical diversification initiatives; ii) implement horizontal policies that address capabilities especially in science, technology, and entrepreneurial education as well as research and development; iii) strengthen intellectual property rights; and iv) be administered independently from the political process with stakeholders from various sectors of the economy and involve independent evaluations. This article identifies fourteen "best practices" that Kazakhstan's diversification initiatives should follow. Alberta's successful oil sands initiatives included 12 of the 14 "best practices" outlined. Finally, Alberta's experience in pursuing "forced growth" or vertical diversification initiatives outside its sectors with conventional comparative advantage has for the most part been ill-fated as most of the initiatives have failed, where failure is indicated by continual government support in the short-run and closure of firms in the long-run.

## INTRODUCTION

In both Alberta and Kazakhstan, resource-based specialization has been the cornerstone of economic growth and development, but at the same time it is a main source of economic

volatility. Furthermore, both jurisdictions are, to some extent, concerned about the issue of permanency of resource-based revenue. As a consequence, there is much Kazakhstan can learn from Alberta's more than 40 years of diversification policies as both jurisdictions pursue policies to address both the short- and long-term issues of resource-based specialization.

As stated in the IMF's September 2013 Country Report, "As a relatively new oil producer, Kazakhstan can learn from other countries' experiences of successes but also many more failures" (IMF, 2013, p.6). Despite Alberta being a sub-national jurisdiction within a developed country, the two jurisdictions face common challenges such as i) labor demand shocks which cause skilled-labor shortages; ii) volatile natural-resource royalty revenues; iii) substantial swings in terms of trade and consequent impacts on real income; iv) strong impacts found in the energy extraction industry spill-over into non-energy industries; and v) the challenge of how to share the resource wealth of today with future generations (ADB, 2012; Chambers, Brisbois and Emter, 2013; Conference Board of Canada, 2013; Kalieva, Arupov, Abaidullaeva, and Biyakhmetov, 2015; Marchand, 2012).

Another reason why Alberta is a good comparison for Kazakhstan is that under the Constitution of Canada, individual provinces have ownership of mineral resources in their jurisdictions, along with sole rights to set the terms under which they are exploited. This includes most areas of environmental regulation, although some elements such as transport and conformance with international emissions targets, also intersect Federal jurisdiction. Crucially, all of the royalty revenues flow only to the producing provinces (Hawkins, in press). Finally, Alberta is a good comparable region because Kazakhstan and Alberta have pursued both vertical and horizontal diversification policies.

[Vertical policies] involve “picking winners”, through preferential treatment of specific non-resource industries (for example, particular manufacturing activities). This may take the form of lower taxes, subsidies, protection from foreign competitors, or direct government investment. The alternative horizontal approach provides incentives for diversification without targeting specific sectors, by raising private returns on investment in physical and human capital across the board. Policies include improvements in property rights protection, contract enforcement and financial regulation, as well as investment in education and infrastructure and broad support for financial development (Guriev, Plekhanov, and Sonin, 2009, p.13).

Evidence from Alberta suggests that government diversification policy should, where possible, complement rather than counteract market forces. Specifically, policies should focus on broadening and expanding industries within the sectors in which Kazakhstan enjoys a comparative advantage (i.e., the mineral resource sector, the agricultural sector, and the transportation sector) rather than change the country's economic base. Furthermore, diversification strategies should i) limit the number of vertical diversification initiatives; ii) implement horizontal policies that address capabilities especially in science, technology, and entrepreneurial education as well as research and development; iii) strengthen intellectual property rights; and iv) be administered independently from the political process with stakeholders from various sectors of the economy and involve independent evaluations. This article identifies fourteen “best practices” that Kazakhstan's diversification initiatives should follow. Alberta's successful oil sands initiatives included 12 of the 14 “best practices” outlined. Finally, Alberta's experience in pursuing “forced growth” diversification initiatives outside its sectors with conventional comparative advantage has for the most part

been ill-fated as most of the initiatives have failed, where failure is indicated by continual government support in the short-run and closure of firms in the long-run.

The remainder of the article is organized as follows. Section provides a discussion of what constitutes “best” diversification practices. Section III discusses Alberta's economic diversification policies since 1974. Section IV summarizes Kazakhstan's economic development and diversification policies since independence. Section V delivers and in depth analysis of Alberta's successful initiatives using the “best practices” outlined in Section II. Section VI concludes by discussing what Kazakhstan can learn from Alberta's successes.

## WHAT CONSTITUTES BEST DIVERSIFICATION PRACTICES?

According to Stiglitz, Lin, and Monga (2013), the question is not whether a government should engage in diversification policy but how to do it correctly and is the justification for pursuing a specific diversification policy economically sound or politically motivated. Needless to say, wrong justifications are still often being made to support diversification policy (Stiglitz, et al., 2013). Therefore, before discussing what constitutes best diversification practice, it is important to understand what economic diversification comprises. As a result, the following is a brief discussion of what is meant by economic diversification. Knowing what diversification is helps the discussion of what are good diversification policies.

Economic diversification may be defined in the context of structural transformation as resources are shifted out of natural resource-based sectors into the manufacturing and

tertiary sectors.<sup>1</sup> This change in economic structure is driven by changes in demand, production technologies, and trade flows. In contrast, other officials and economists consider diversification to be short-to medium-term focused with an aim to reduce an economy's vulnerability to general cycles (Conroy, 1975). However, nowadays economists and policy analysts have enlarged the scope of economic diversification to include: production or output diversification, export diversification, FDI diversification, financial diversification, fiscal diversification, and regional diversification (Forneris, 2016). This categorization lessens the problems of defining diversification as it deals with the multi-dimensionality of diversification.

The following are short descriptions of the diversification types outlined by Forneris (2016):

- **Product diversification** involves the addition of new products to the existing portfolio of products that a country produces;
- **Export diversification** sometimes referred to as geographic diversification, attempts to reduce a country's GDP volatility by reducing the country's exposure to external shocks by adding new products to the country's export basket, entering new markets, improving the quality of existing exports, and diversifying exports into the service sector;
- **FDI diversification** refers to diversifying the type of FDI that a country receives, receiving FDI from new sources, or exporting FDI to new countries;
- **Financial diversification** The refers to the investment of government savings, which can be sovereign wealth funds,

in a diversified portfolio of assets to finance future government consumption;

- **Fiscal diversification** involves increasing taxes and fees on the non-oil sector to reduce the reliance on oil revenues for financing spending; and
- **Regional diversification** refers to the "pursuit of "diversified" local economic structures in response to potentially unstable dependence upon single industries or groups of industries" (Conroy, 1975, p. 492).

Mansell and Percy (1990) suggest that adopting a very broad definition of diversification and working within this definition will result in more effective diversification policies. The following list of "best practices" for economic diversification is applicable to this broad definition of diversification and relies heavily on the work of Mansell and Percy (1990), Rodrik (2005), Guriev et al. (2009), Lee (2013), Lin and Monga (2013), and Forneris (2016). It is important to remember that economic diversification represents an attempt to change the structure of a country's (or region's) economy and the time it takes to achieve significant structural change is typically measured in decades, which is longer than most governments' policy and planning horizons (Mansell and Percy, 1990).

Therefore, for a diversification initiative to be effective it must include most of the following:

1. A clearly defined and realistic diversification objective.
2. Both horizontal and vertical approaches with each being carefully focused and effectively designed.
3. Long-term political commitment.

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<sup>1</sup> The reader is referred to Barghouti, Timmer, and Siegel (1990) and Petit and Barghouti (1992) for further discussion on this definition of economic diversification.

4. Substantial public investment in infrastructure, education, life-long learning, and health.
5. Target on economic activities (technology transfer or adoption, training, etc.), not industrial sectors.
6. Active research collaboration between government, business, and academia.
7. Effective institutions to promote, facilitate, and regulate economic activity and investment. These should encourage licensing, FDI, or technology transfer in targeted sectors; linkages between foreign and domestic firms; and private investment in innovation and skills development.
8. Focus on industrial development in general rather than on industrial diversification.
9. Incentives and subsidies provided for only new activities.
10. Clearly defined benchmarks and criteria for success and failure of subsidized projects.
11. Clearly defined expiration dates for subsidies.
12. Only activities that have clear potential to provide spillovers and demonstration effects are subsidized.
13. Diversification activities to be closely monitored by a Review and Monitoring Committee with representatives from industry, government, a national research council, and banking industry.
14. Focus on the use of local labor and the development of extensive backward and/or forward linkages in the country.

As the list identifies, the process of diversification is what matters. "Sectors should not be selected on the basis of some preconceived idea of what they are, but should ideally emerge naturally from ... [a] collaborative process, and ... eliciting information on the private sector's willingness to invest in the different areas, subject to removal of obstacles" (Rodrik, 2005, p. 5

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Furthermore, diversification draws upon a large variety of productive capabilities, such as infrastructure, knowledge, institutions, etc. (Hartmann, 2014). Lee (2013) argues that capability failures, rather than market failures, are the most serious hurdle for successful diversification policies in developing countries and the source of the middle-income trap. Weak firm-level R&D effort and innovation capabilities are serious impediments of development strategies. Finally, technology plays a vital role in diversifying natural-resource-based economies (OECD, 2013a). Nevertheless, "without the initial set of economic opportunities and systematic interrelations between institutions, knowledge, production and demand, the virtuous circles of recombinant growth, evolutionary learning and innovation cannot start. ... [Diversification] policies are needed to create the *incentives*, *institutional environment* and *economies of scale* required to allow enterprises in developing countries to grow, to innovate and to be competitive on global markets" (Hartmann, 2014, p. 67, italics are added by the author for emphasis).

## ALBERTA'S DIVERSIFICATION INITIATIVES

In 1974, Alberta's Progressive Conservative Government led by Peter Lougheed released a memo titled "The Management of Growth". The objective of the government's program outlined in the memo was to transition Alberta from "a primarily extractive economy, where ... resources are exported for processing to other parts of Canada and the rest of the world, to an industrialized economy which ... [would] see further processing of ... raw materials, increasing manufacturing and ... satisfying employment opportunities for Albertans" (Richards and Pratt, 1979, p.232).



Later in the same year, the government set out the following five objectives of the province's industrial strategy:

1. To diversify, in the sense of becoming less dependent upon unprocessed resources, particularly non-renewable resources;
2. To decentralize economic activity [within Alberta];
3. To promote the growth of the private sector by strengthening small and local businesses;
4. To upgrade the skills of the Alberta work force to create higher productivity; and
5. To pursue the competitive advantages available to ... [Alberta] by virtue of its natural resources (Mansell and Percy 1990, p.121).

Many of these initiatives were integrated with a new oil sands development policy that would keep more jobs and royalties in Alberta (Sweeney, 2010).<sup>2</sup> A key component of this policy was the formation of the Alberta Oil Sands Technology and Research Authority (AOSTRA) for promotion of the development of new technologies for oil sands and heavy-oil production. Furthermore, the development policy identified the issues of critical shortages of skilled labor, equipment, and materials as well as lack of housing and infrastructure around the oil sands deposits (Chastko, 2004).

The ensuing decade saw increased government involvement and investment in the economy in addition to a focus on developing the oil sands deposits. "Notable examples of government investment in private businesses and crown enterprises included Pacific Western Airlines, Alberta Energy Company, Prince Rupert Terminal, Alberta Opportunity Company, Agriculture Development Corporation, Alberta Home

Mortgage Corporation, and various investments made through the Heritage Savings Trust Fund" (Chambers, Brisbois and Emter, 2013, p. 108).

In 1984, the government of Alberta released a white paper entitled "Proposals for an Industrial and Science Strategy for Albertans, 1985 to 1990. Its intention was to "promote discussion about the province's industrial policies and need to reassess policies that had been in place since 1974" (Mansell and Percy, 1990, p. 121). The white paper's recommendations were similar to those outlined in 1974 with the exception of "a greater emphasis on developing and exploiting the talents of the province's human resources, the provision of jobs, and the pursuit of new economic developments besides resource upgrading" (McMillan, Percy, and Wilson, 1984, p. 28). In fact, one of the more extraordinary passages the paper recommended was that "education should foster ideas of risk taking, innovation and the pursuit of excellence (Government of Alberta, 1984, p.67). Specifically, the policy gave "priority to [both research and educational] programs felt to complement the government's strategy by supporting science and technology oriented industry" (McMillan et al., 1984, p. 30).

When Ralph Klein became the province's Premier in 1992, he pledged to turn the economy around after a difficult recessionary period. In 1993, his government released the document "Seizing Opportunity: Alberta's New Economic Development Strategy" which set out a new role for government in the economy based on creating a business "climate conducive to investment and job creation through low taxes, an improved regulatory environment, and job creation through skills development" (Chambers et al., 2013, p. 110). This new policy reduced or eliminated direct assistance to business, with the exception of continued support for development of the oil

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<sup>2</sup> Before 1974, the Oil Sands Development Policy "either prohibited or severely restricted the holders of Oil Sands or Bituminous Sands Leases from obtaining building

permits to build plants and to develop commercial production from these leases" (Chastko, 2004, p.145).

sands. The government restricted its direct efforts to facilitating “private sector investment in the emerging industries of construction and engineering, environmental products and services, communication and information technologies, telecommunications and electronics, aerospace and advanced materials, health services and biotechnology, and transportation” (Chambers et al., 2013, p. 110). Another outcome of the strategy was the creation of the Alberta Economic Development Authority (AEDA) in 1994 with the mandate to develop strategies and make recommendations to government to remove barriers to economic growth and to expand investment, business opportunities and jobs for Albertans.

For continued oil sands development, Premier Klein initiated the Canadian Oil Sands Network for Research and Development (CONRAD), and gave it a \$105 million annual budget to find ways to boost production and trim costs. In its 1995 paper, “The Oil Sands: A New Energy Vision,” CONRAD outlined a twenty-five-year growth strategy. The paper proposed investing up to \$25 billion to boost production in stages from 450,000 barrels a day to a million. CONRAD “predicted that all of this activity would create 10,000 direct new jobs” (Sweeney, 2010, p. 130). Upon request of CONRAD, the Alberta government reduced provincial payments to a minimum 1% of revenue from synthetic crude oil sales before project payout and 25% of net revenue after payout (a reduction from 50%). “The amount of [investment] funding quintupled in the seven years following the regime change. In the seven years up to 1995, \$5.5 billion was spent on Sands projects. From 1995 to 2002, the amount was a staggering \$24.5 billion, one of the biggest industrial expansions in Canadian history” (Sweeney, 2010, p. 131).

In the fall of 1997, the provincial government held a growth summit that engaged Albertans in a province-wide discussion about priorities for action. At the same time, the Alberta Science and Research Authority developed “Securing Tomorrow’s Prosperity: Sustaining the Alberta Advantage,” an innovation strategy

designed to expand Alberta’s knowledge-based economy. It repeated the commitments from the earlier documents regarding building a skilled workforce, creating a competitive business climate through low taxes, streamlining regulation and creating more infrastructure, as well as making a commitment to building Alberta’s innovation system and increasing research and development. It also pledged to assist the growth of a restated set of value-added sectors which included energy technologies and services, value-added energy products, agri-food, building and wood products, tourism, information and communications technologies, health and bio-industries, and environmental technologies and services.

In 2005, the Provincial Government released a 2005 update to “Securing Tomorrow’s Prosperity: Sustaining the Alberta Advantage.” The document repeated the earlier commitments, but set the stage for more cultivation of non-energy value added sectors by defining outcome measures of sector performance to be achieved by 2013.

When Premier Stelmach assumed office in 2006, it became clear that Alberta’s competitive advantage was slipping (Chambers et al., 2013). In response, the Government created Productivity Alberta with a mandate to improve Alberta’s performance. Premier Stelmach also renewed the focus on technology commercialization, releasing “Alberta’s Action Plan: Bringing Technology to Market” which announced initiatives such as a science and research experimental development tax credit, a \$100 million Alberta Enterprise Corporation to participate in venture capital funding, and innovation vouchers to assist firms in accessing support for specific technologies. In addition, in July 2009, the Premier’s Council for Economic Strategy was created to help give a broad, external perspective on what Alberta needs to do to secure the province’s long-term prosperity.

Early in 2010, the Government introduced the Alberta Competitiveness Act which authorized

the creation of a body that would develop initiatives to increase competitiveness, develop performance benchmarks for competitiveness, encourage innovation and technology adoption, and create effective regulatory systems.

To sum, the Alberta Government has taken an active role in cultivating economic development and diversification over the past 42 years. But it is clear that the approach has not been consistent. At various periods, the strategy has been either highly interventionist or focused on improving the business climate while assisting selected sectors. In 1974, the Government of Alberta's diversification policies implied the movement "to a broader based economy which is less dependent on non-renewable natural resources in order to guard against the possibility of longer run secular decline in oil and gas production" (Drugge and Veeman, 1980, p. 223).

However, during the period of 1975 to 1990, diversification in Alberta was geared more to the issues of forced-growth vertical diversification or "province-building" than to the mitigation of short-run instability (McMillan and Norrie, 1980). Part of the "province-building" initiative was the Alberta Government becoming involved in specific projects such as the oil sands to expand industries that have the characteristics of being export oriented, using very capital-intensive production processes, embody high technology, and use highly trained and educated labor force and extensive backward linkages to existing

industries in the province as well as extensive forward linkages that allow for substantial upgrading in the province (Mansell and Percy, 1990). These initiatives, with the exception of the oil sands project, were for the most part unsuccessful. Morton and McDonald (2015) have identified 31 failed diversification projects<sup>3</sup> compared to only 6 initiatives<sup>4</sup> that benefited the provincial economy. Furthermore, Morton and McDonald (2015) estimated that between 1974 and the early 1990s, the government lost an estimated \$2.3 billion (not adjusted for inflation) on the various unsuccessful initiatives.

Other diversification initiatives were horizontal (sometimes referred to as "shotgun") market-based diversification approaches. That is, none of the initiatives were dependent on the success of one or a few projects. Rather, the policies were focused on creating "good" business climate and living conditions; investing in human capital, spending on social infrastructure, and providing venture capital. That is, Alberta promoted itself using low tax rates to attract labor and capital funded by resource royalties (Emery and Kneebone, 2008). After the early 1990s, the government's diversification initiatives stopped funding vertical initiatives, other than the oil sands. That is, they primarily focused on "making Alberta a tax competitive jurisdiction that can attract both financial and human capital, combined with public investment in infrastructure" (Morton and McDonald, 2015, p.21) and indirect subsidization of the development costs of non-conventional oil

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<sup>3</sup> Twelve of the most costly failed diversification projects include: NovaTel, Swan Hills Waste Treatment Plant, Lloydminster Bi-Provincial Upgrader, Millar Western Pulp Ltd., Gainers, Magnesium Company of Canada, Prince Rupert Grain Terminal (Ridley Grain Ltd.), Alberta Pacific Forest Industries, Chembiomed, Canadian Commercial Bank, Northern Lite Canola, and General Systems Research (Morton and McDonald, 2015).

<sup>4</sup> The six initiatives that benefited the province include: Syncrude, Alberta Energy Company, The Ethane-Based Petrochemical Industry, Luscar Ltd., Bank of Alberta/Canadian Western Bank, and Pacific Western Airlines (Morton and McDonald, 2015). Syncrude Canada Ltd., formed to develop Alberta's oil sands in 1964, was a consortium of Imperial Oil (an affiliate of Exxon), Atlantic

Richfield (ARCO), Royalite Oil (later combined with Gulf Canada), and Cities Services R&D (Humphries, 2008). In 1974, ARCO withdrew from the consortium and the Government of Alberta, with the Canadian Federal Government and the Government of Ontario purchased the shares sold by ARCO (Morton and McDonald, 2015). Syncrude's current ownership structure is as follows: Canadian Oil Sands Partnership. (37%), Sinopec (9%), Imperial Oil (25%), Mocal Energy Ltd. (5%), Murphy Oil Co. Ltd. (5%), Nexen Inc. (7%), and Suncor Energy Ventures Partnership (12%) (Syncrude, 2016). The Alberta Energy Company participated in oil sands, petrochemicals and pipelines to encourage expansion and development (Drugge and Veeman, 1980).



reserves. In 2014, 58% of Canada's (or 78% of Alberta's) oil production was generated from non-conventional sources, specifically oil sands located in Alberta (Natural Resources Canada, 2016).<sup>5</sup>

The evidence provided above shows that the popular opinion that the oil sands industry is mainly the product of private sector entrepreneurship is false. The oil sands venture became commercially viable only through a long-standing partnership between government, the research community, and private investment both domestic and foreign (Hawkins, in press). That is, involvement of the Alberta Provincial Government in the oil sands development has been critical – that is, without the Government's involvement, the industry would not be as prominent as it is today.

Currently, the general approach to diversification policy in Alberta has evolved into *Alberta Innovates*, complex of technology development corporations, funded partly through the Alberta Heritage Trust and other Provincial agencies, partly by industry, and partly by revenues from the Alberta carbon cap-and-trade system. Although still significantly involved with energy and environmental research fields, this structure is now mainly oriented to the creation and growth of technology start-ups in a variety of sectors.

## KAZAKHSTAN'S ECONOMIC DEVELOPMENT AND DIVERSIFICATION INITIATIVES

A key objective in Kazakhstan's sustainable development program and the corresponding economic and industrialization policies is "to

promote the diversification of the economy, particularly given its extensive natural endowments" (World Bank, 2003, p. 7). Kazakhstan has been pursuing diversification initiatives since 1992 with the "Strategy for Formulation and Development of Kazakhstan as a Sovereign Nation" in which the government set the course for the i) development of new markets for exports, ii) prioritized development of manufacturing and science-intensive industries, and iii) promotion of import substitution to employ modern domestic and international technology and equipment (Khakimzhanov and Seitenova, 2013). This strategy mirrored the "selective open-economy" development strategies of the Asian Tigers during the 1970s and 1980s.

In 1997, President Nazarbayev set out his vision of Kazakhstan's future to 2030 in the document "Kazakhstan 2030: Prosperity, Security, and Improvement of Welfare of Citizens of Kazakhstan," or simply "Kazakhstan 2030 Strategy." The strategy outlined a long-term process of developing the country by focusing on national security; domestic stability; economic growth based on an open economy with high levels of foreign direct investment and high domestic savings rates; and high quality health care and education to improve the well-being of Kazakhstani citizens. The "Kazakhstan 2030 Strategy" has associated with it multi-year strategic plans as well as specific "development" plans and strategies. The first strategic plan, "Strategic Development Plan for 1998 – 2000" had as one of its objectives the diversification of the economy.

The second strategic plan, "Strategic Plan 2010" was approved in December 2001 and outlines eleven key priority directions and the expected accomplishments of building a sustainable long-term base for a competitive economy and doubling the country's GDP by 2010 (Republic of Kazakhstan, 2001). The socio-economic targets of the "Strategic Plan

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<sup>5</sup> Most of the known recoverable oil sands reserves in Canada, considered to be the third largest reserves of oil in the world, are contained in the Athabasca, Peace River

and Cold Lake deposits, close to 98% of these located in central and northern Alberta (Alberta Energy, 2016).

2010” have been largely achieved, Kazakhstan emerged from the first decade of the 21st century with average GDP growth of 8.4% and poverty headcount at only 6.5% (World Bank, 2014). The government established four new institutions to support the objectives of the Strategic Plan 2010: The Development Bank of Kazakhstan (now Samruk-Kazyna) in 2001, the Investment Fund of Kazakhstan (KIF) in 2003, the National Innovation Fund (NIF) in 2003, and the Export Insurance Corporation (now KazExportGranat) in 2003. Samruk-Kazyna was established to provide medium-and long-term loans to the private sector and major state programs. These loans usually have interest rates below market rates and are expected to finance high-risk, long-term projects.

Today, Samruk-Kazyna operates in “five key strategic areas:

- i) stabilization of the financial sector;
- ii) problems in the real estate market;
- iii) support of SMEs;
- iv) agribusiness development; and
- v) implementation of innovation, industrial and infrastructure projects” (Islamic Development Bank, 2011, p.27).<sup>6</sup>

The NIF was initiated to help develop high-tech innovation activities and to create technoparks and research-intensive products. The main objective of the KIF is to provide support for private initiatives through holding non-controlling shares of enterprises both in Kazakhstan and abroad.

In addition to “Strategic Plan 2010,” the “Innovative Industrial Development Strategy 2003 - 2015” (IIDS 2003 – 2015) was enacted in 2003. The key goal of the IIDS 2003 – 2015 was to develop the country’s economy through diversification away from extraction-based development and prepare for the transition to a service- and technology-based economy in the long term.

Some of the objectives IIDS 2003 – 2015 included:

- i) increasing the share of industry in GDP from 46.5% to 52% by 2015 and curtailing the decline in the share of services in GDP to 40.6%;
- ii) averaging 8.4% growth for manufacturing industries so as to reduce the decline in the share of manufacturing in GDP to 12%;
- iii) tripling the labor productivity by 2015 compared to 2000;
- iv) establishing science-intensive and high-tech exports by increasing the share of research and innovations in GDP from 0.9% in 2000 to at least 1.5% in 2015;
- v) diversifying exports by targeting goods and services with high value added; and vi) transitioning to international quality standards (RoK, 2003).

Another key strategic plan was implemented in 2004, the “Diversification of Kazakhstan’s Economy through Cluster Development in Non-Extraction Sectors” or simply the “Cluster Development Plan,” based on the ideas of Michael Porter (2000). Kazakhstan’s cluster strategy is twofold. First, given the large energy resources and agricultural production, there is an attempt to develop these two as clusters. Secondly, it is recognized that there has to be diversification of the economy (World Bank, 2005; Rakhmatulina, 2006; Zashev and Vahtra, 2006). Due to these objectives, the government of Kazakhstan ‘created’ seven pilot cluster projects: tourism, metallurgy, textiles, construction, agriculture and food processing; oil and gas machinery building, and logistics and transportation – which are intended to become the core of Kazakhstan’s competitive economic strength (Zabortseva, 2009). Later additions were cotton, wine and fish clusters. Several economists (e.g., Wandel, 2010) have criticized the government’s selection process as it did not rely on market forces as a discovery procedure; but, rather on

<sup>6</sup> OECD (2013b) reported Samruk-Kazyna’s share of GDP at 57% in 2010, and International Crisis Group (2013)

stated that “by 2013, Samruk-Kazyna owned assets worth \$103 billion accounting for just over half of GDP” (p. 9).

committees consisting of representatives from government bodies, business associations, universities, and research institutions (Batalov, 2007).

According to Pomfret (2013), there was an apparent change in industrial policy in March 2010 as the IIDS 2003 – 2015 was replaced by the “State Program on the Accelerated Industrial-Innovation Development of the Republic of Kazakhstan 2010-14” (AIIDS 2010 – 2014). This ‘change’ was caused by the home-grown banking crisis in 2007, the Global Financial Crisis of late 2008 and 2009, and the development of the Customs Union of Belarus, Russia and Kazakhstan. During the development of AIIDS 2010 – 2014, the government readdressed its role as well as the role of the market in Kazakhstan’s development. The principal differences between the IIDS 2003 – 2015 and the AIIDS 2010 – 2014 are the government’s plan of ‘forced’ vertical diversification, both upstream and downstream, of its traditional export-oriented industries (oil and gas, ferrous and non-ferrous metals, uranium, and grains) as well as supporting initiatives in non-oil and gas sectors (e.g., pharmaceuticals, ceramics, aerospace) (RoK, 2010). Furthermore, the government is accelerating development of light industry products to take advantage of the larger Customs Union market of 170 million people.

The second 10-year strategic plan, “Strategic Plan 2020,” was enacted in February 2010 with five of its goals being:

- i) to ensure sustained growth of Kazakhstan’s economy by way of accelerated diversification and industrialization and infrastructure development so that by 2020 Kazakhstan non-resource exports will contribute more than 45 percent to all exports;
- ii) to increase the competitiveness of its labour force such that access to skilled labour is no longer a constraint but an asset for domestic and international firms;
- iii) to join the World Bank’s “Doing Business” list of the fifty most competitive countries in the world;

- iv) to join the first one-third of the countries in Transparency International’s corruption perception index; and
- v) to decrease the proportion of the population with incomes below the subsistence minimum to 8 percent (RoK 2010b; Khakimzhanov and Seitenova, 2013).

On December 14, 2012 President Nazarbayev delivered a second ambitious vision for Kazakhstan in a speech now referred to as the “Kazakhstan-2050 Strategy.” The core of the vision is that Kazakhstan will join the rank of the top 30 developed economies by 2050. The Strategy’s key objectives include:

- i) transitioning to new principles of economic management;
- ii) comprehensive support for entrepreneurship so it will be a leading force for the national economy;
- iii) creating a modern and efficient education and health care systems; and
- iv) increasing accountability, efficiency and functionality of the state apparatus.

The first major plan that is designed in accordance with the long-term priorities of the “Kazakhstan-2050 Strategy” is the “State Program on Industrial-Innovative Development of Kazakhstan for 2015-2019 (AIIDS 2015 – 2019). Its main goals are:

- i) accelerated development of the manufacturing industry;
  - ii) improving the business climate; and
  - iii) promoting entrepreneurship and the development of small and medium sized businesses in manufacturing (RoK, 2014).
- Some of the expected results are increasing of value added in the manufacturing sector by at least 60%; increasing labor productivity in the manufacturing sector by at least 40%; increasing the value of non-commodity (processed) exports by at least 70%; and increasing labor working in the manufacturing sector by at least 53 thousand (RoK, 2014).

In May 2015, the President publicly put forth a strategy known as “100 Concrete Steps,” designed to oversee the implementation of what are referred to as “Five Institutional Reforms”. The five reforms are:

i) professionalizing public administration;  
ii) strengthening the rule of law;  
iii) increasing state transparency and accountability;  
iv) fostering economic diversification and growth; and  
v) bolstering national identity and unity. (World Bank, nd). Strengthening institutions (via “100 Concrete Steps”), improving physical infrastructure (via the Nurlı Zhol Infrastructure Development Program), and raising the quality of human capital (as part of the skills-enhancing agenda) are all key pillars of the long-term “Kazakhstan 2050” development strategy.

The specific steps of the “100 Concrete Steps” strategy related to supporting economic diversification are steps 63 and 64. The 63rd point “foresees the development of two innovative clusters to accelerate the creation of a knowledge-based economy. Scientific centres and laboratories will be established at the Astana business campus of the Nazarbayev University to conduct joint scientific and research projects, their development, testing and commercialization. They will be encouraged to cooperate with local and foreign high-tech companies. ... Activities of the Park of innovative technologies are aimed at the development of high technologies in the following sectors: information and communication technologies, new materials, environmental protection and energy saving, electronics and instrumentation, [and] oil and gas sector” (InExCB-KZ, 2016, p.9). The 64th point foresees the development of the law “on commercialization of the results of research and (or) science and technical activities”, which defines the process of financing innovation implementation in industry. The focus of scholarly grant and program structure will be reformed to reflect the needs of the State Program of Accelerated Industrial and Innovative Development (InExCB-KZ, 2016).

To summarize, when examining Kazakhstan’s industrial policies since 2003, it becomes evident that the priority sectors have remained remarkably consistent since the initial selection for the IIDS 2003-2016. Since independence in 1991 the Government of Kazakhstan has issued more than twenty trade and industrial policy statements, each with a policy horizon of at least three years (Khakimzhanov and Seitenova, 2013). Few programs lasted long enough to reach their termination date as the majority were discarded ahead of schedule and replaced with revised versions. However, when diversification plans are assessed as a group it becomes evident that the overarching goals of Kazakhstan’s diversification initiatives can be separated into two themes: avoiding the “resource curse”<sup>7</sup> and building linkages. Since independence, Kazakhstan has used its comparative advantage in oil to first “kick-start” its ailing economy and second to ensure that the revenues from its oil reserves contribute to sustainable development. In the late 1990s, the government’s focus has been towards “avoiding the resource curse” (Khakimzhanov and Seitenova, 2013). The National Fund was set up to deal with the serious macroeconomic and fiscal challenges that mineral-dependent countries commonly face. The “Kazakhstan 2030 Strategy” and accompanying multi-year plans aimed to vaccinate Kazakhstan from the perils of Dutch Disease<sup>8</sup> by addressing low competitiveness of the non-resources traded sectors, poor conditions of social and fiscal infrastructure, and “low” quality of institutions. Since 2010, that is the AIIIDS 2010 – 2014, “building linkages” has received more attention. The development of both ‘upstream’ and ‘downstream’ linkages in Kazakhstan’s traditional sectors (oil and gas, ferrous and nonferrous metals, and agriculture) have been identified as priorities. Furthermore, consumption linkages have been targeted by developing industries with principal interest of

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<sup>7</sup> “Resource curse” refers to the condition that countries endowed with an abundance of natural resource wealth, especially minerals and fuels, tend to grow more slowly than resource-poor countries.

<sup>8</sup> “Dutch Disease” is defined as the combined effects of i) exchange rate appreciation and ii) labour and capital migration away from the country’s manufacturing and agricultural sectors to its domestic service and resource sectors, raising production costs (Ross, 1999).



supplying the home market. A good example of this is the importance given to the national pharmaceutical and automobile industries.

To date, Kazakhstan has had minimal success in implementing many of its diversification initiatives (Felipe and Hidalgo, 2015) and, as a result, many of its initiatives have had limited success (OECD, 2016; Felipe and Hidalgo, 2015). Furthermore, Felipe and Hidalgo (2015) as well as Khakimzhanov and Seitenova (2013) caution the validity of these “limited successes” as the Kazakhstan Government does not follow systematic monitoring and evaluation frameworks. However, Howie (in press) warns about making preliminary conclusions about success or failure of Kazakhstan’s diversification initiatives as these “initiatives are in very early stages and may take years or decades for the full effects to come to fruition” (p.3).

## IN DEPTH ANALYSIS OF ALBERTA'S SUCCESSFUL INITIATIVES

*One could almost say the oil sands are one big science project.*

— Deborah Yedlin, The Calgary Herald

*Roger Butler's invention of steam assisted gravity drainage (SAGD) has had a staggering economic impact. It will eventually change the whole geopolitics of oil in the world.<sup>9</sup>*

— Tom Harding, Head of Chemical and Petroleum Engineering, University of Calgary

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<sup>9</sup> Butler first contemplated the SAGD process and developed his theory in 1969 when he was working at Imperial Oil's Sarnia refinery (Sweeney, 2010) and it took until 1978 for the first actual testing of the SAGD process in northeastern Alberta (Castko, 2004). The first SAGD bitumen made it to market in late 2001 (Sweeney, 2010). In the SAGD process, “a pair of horizontal wells, situated 4 to 6 metres above the other, is drilled from a central well pad. In a plant nearby, water is transformed into steam which then travels through above-ground pipelines to the

The Government of Alberta's oil sands initiative, and more generally its diversification initiatives, has enabled the Alberta economy to make the transition from a resource-based economy to one based more on knowledge and innovation (Cabalu, Hassan, and Manuhutu, 2008). During the over 40 years of diversification initiatives, the province has pursued both horizontal and vertical diversification strategies. As Morton and McDonald (2015) show, many of Alberta's vertical diversification strategies have failed with the exception of downstream processing of its natural gas and oil reserves and the oil sands initiative. Furthermore, several authors have lauded Alberta's horizontal diversification strategies (refer to Morton and McDonald, 2015; Chambers et al., 2013; Emery and Kneebone, 2008). Therefore, this section will examine why Alberta's oil sand initiative has been successful when other “forced growth” vertical strategies have failed and point out the horizontal strategies that have been especially important for the oil sands' success.

To comprehend Alberta's diversification initiatives, the reader must understand that oil from the oil sands is synthetic – that is, it is a manufactured product with a supply and production chain that is closer to that of a manufacturing enterprise than of a purely extractive one (Hawkins, in press). As a result, although measured officially as a resource export, synthetic crude is actually Alberta's, as well as Canada's largest manufactured export.

Researchers, including Chastko (2004, 2012) and Hester and Lawrence (2010), have identified five key features of the Government of Alberta's initiatives that were particularly

wells and enters the ground via a steam injection (top) well. The steam heats the heavy oil to a temperature at which it can flow by gravity into the producing (bottom) well. The steam injection and oil production happen continuously and simultaneously. The resulting oil and condensed steam emulsion is then piped from the producing well to the plant, where it is separated and treated (Alberta Government, 2013, paragraphs 1 and 2)



important for the successful development of the province's oil sands:

1. The Alberta Government acted quickly to exploit a window of opportunity provided by the 1970s oil crisis to attract foreign commitment and investment in to a fledgling non-conventional crude oil industry.
2. From the beginning, exploitation plans, including regulation, investment stages, and the management of social costs were linked with strategies to enhance and develop relevant locally-based capabilities and skills in science, technology and project management.
3. The Alberta Government commitment was long-term and insulated from other political demands through an arms-length institutional structure.
4. The creation of AOSTRA for the Government of Alberta to be the main stakeholder and owner of the key technologies and processes – SADG and Cyclic Steam Stimulation – that made synthetic crude production possible at a relatively competitive cost.
5. The Alberta Government established funded institutions with the specific objective of transforming wealth from the oil sands into a broader range of industrial developments, mainly through knowledge investments in science and technology.

These five initiatives provide evidence that Alberta's diversification initiatives included "best practices" items 1 through 9 and 12 through 14 as outlined in Section IV.

Alberta's oil sands strategy has been principally an endeavor to deploy science and technology to enable the extraction and export of ever greater quantities of a low-value-added commodity. Without these knowledge

investments, Canadian bitumen would still be sitting in the ground. One novel approach to R&D that the Government of Alberta has pursued is the "Open Innovation Method to R&D". Open Innovation is a technological innovation method where new technology is developed under a consortium with technical inputs from experts of various companies and governments. The participants of a joint technology development project receive world-wide use rights of the new technology for a fraction of the total cost of development (Hakkim and Heidrick, 2008). In Alberta, the Alberta Energy Research Institute and AOSTRA use the Open Innovation approach.<sup>10</sup> AOSTRA developed and tested the SADG process for the in-situ recovery of bitumen from oil sands. The SADG project had ten major industrial participants: Amoco Canada Petroleum Limited, Chevron Canada Resources Limited, Conoco Canada Limited, China National Petroleum Corporation (CNPC) Canada Limited, Imperial Oil Resources (ESSO) Limited, JAPEx Oil Sands Limited, Suncor Inc., Petro-Canada, Shell Canada Limited, and Syncrude Canada Limited. In addition, the Canadian Federal Government was a partner through Energy Mines Resources Canada (Hakkim and Heidrick, 2008).

It is important to realize that the ultimate potential of the oil sands industry does not lie in extraction and export of synthetic oil nor in its upgrading. Rather, it lies in how the knowledge and skills created while developing the oil sands can be transformed and translated to other endeavors (Hawkins, in press). For example, the problems of CO<sub>2</sub> management, land reclamation, and water management will be ongoing global problems of ever increasing magnitude. The knowledge, technology, and science surrounding non-conventional oil extraction could be reoriented to the creation of technology and services industries in these fields, which also would be

<sup>10</sup> Other Canadian agencies that use the Open Innovation method to promote R&D in the energy sector include: Petroleum Technology Alliance Canada, Petroleum Research Atlantic Canada, National Research Council of

Canada, Canadian Industry Program for Energy Conservation, Energy Council of Canada, Canadian Energy Research Institute, and Natural Resources Canada (Hakkim and Heidrick, 2008).

of high and specialized export value. To ensure that Alberta has the capabilities to sustain an economy of knowledge and innovation, the province funds math and science camps for high school students, and research infrastructure at Alberta universities is supported by the provincial government through Alberta Innovation and Science and Alberta Learning. Alberta's public schools and post-secondary institutions are ranked with the world's best in terms of the quality and, as a result, Albertans are among the best educated people in North America (Alberta Government, 2016).<sup>11 12</sup>

Finally, financial incentives are the key reason why companies perform R&D. Zhao (2006) provides evidence that strong intellectual property rights are required for inter-firm and government R&D collaboration. In the presence of weak intellectual property rights, firms have to strategically internalize their knowledge-intensive activities. As Canada ranks 8th in the world for well-defined and functioning intellectual property rights according to the 2015 International Property Rights Index (PRA, 2016), firms are not afraid of inter-firm R&D collaborations to spread risk.

To sum, Alberta's oil sands initiative has been successful because it exhibited most of the "best practices" features outlined in Section IV. Furthermore, it succeeded because the Government of Alberta used both horizontal and vertical diversification initiatives with the former dominating after 1992. One reason why many of the early vertical initiatives failed in Alberta is that there was little market discipline, thereby encouraging inefficiency (Morton and McDonald, 2015). Many authors suggest that vertical diversification initiatives should be used very selectively and carefully as well as "are based upon some clear

competitive advantage in the form of access to raw materials, access to market, labor productivity and entrepreneurial skill, innovation, or agglomeration economies" (Mansell and Percy, 1990, p.131).

## WHAT KAZAKHSTAN CAN LEARN FROM ALBERTA'S SUCCESSES

*Kazakhstan's industrial policy needs to be coordinated, simplified, streamlined and strictly monitored.*

- Jesus Felipe and Changyong Rhee, Asian Development Bank

*"it takes all the running you can do to keep in the same place. If you want to get somewhere else, you must run at least twice as fast as that!"*

- Lewis J. Carroll, Through the Looking-Glass (New York, The Heritage Press, 1941), p. 41.

Currently, Kazakhstan is pursuing economic diversification initiatives that emphasize and prioritize knowledge-intensive and innovative industries within four main areas: i) energy; ii) metallurgy and machinery; iii) agriculture and food processing; and iv) integrated chemicals (Felipe and Rhee, 2013). However, it concurrently is supporting the consumption linkages of national automobile and pharmaceutical industries. Evidence from Alberta indicates that Kazakhstan's diversification initiatives should focus on its comparative advantages – that is, on its huge reserves of mineral resources and agricultural resources. Policies aimed at creating new comparative advantages in the automotive and pharmaceutical industries should be

<sup>11</sup> According to the Programme for the International Assessment of Adult Competencies, Alberta adults ranked first among the Canadian provinces for both numeracy and literacy skills and also for problem solving skills (Alberta Government, 2016).

<sup>12</sup> This paper does not rank Alberta's standing in innovation measured by the Gross Expenditure on

R&D/GDP (or GERD /GDP) ratio. The GERD/GDP ratio is now thoroughly discredited as a measure of an economy's innovativeness - it depends heavily on the proportion manufacturing activities in an economy, and disregards access to new technology such as via free transfer of R&D from multinational headquarters, as well as expenditures targeted at delimiting new mineral reserves (Palda and Pazderka, 1982).

assessed extremely carefully. Experience from Alberta shows that initiatives outside of comparative advantages have a high probability of failure, where failure is indicated by continual government support in the short-run and closure of firms in the long-run. Further evidence from Alberta suggests horizontal diversification strategies as well as capability development need to be a top priority for Kazakhstan. Alberta was the first Canadian province to publicly support research as a principal component of its industrial development (Palda, 1984). The Alberta Research Council was created in 1921 "to ascertain more definitely the mineral resources of the country and the possibility of their development" (LeRoy and Dufour, 1983, p. 16). The focus on capabilities is reinforced by Lee (2013) as follows "For a developing country, it is critical to enhance its capability to produce and sell products in the international market" (p. 245). It is clear that Kazakhstan has a fundamental capability constraint if its aim is to produce goods and services with higher technological content as announced many time in its development strategies (Farra, Sigalova, Dmitrieva, Klos, and Ospanova, 2015). Kazakhstan's education skills – especially in science, technology, and engineering – lag well behind those of East Asian and successful resource-intensive countries (Howie, in press). A "strong position in basic sciences at the national level is ... economically important, because it provides research training, state-of-the-art development and use of research techniques and instrumentation, and access to high-quality international networks" (Laursen, 1996, p.1133). Furthermore, economic benefits of investment into basic sciences "accrue, not only because research conducted by the scientists of a given country, but (mainly at least in a small country case) because of the ability to assimilate the results of basic research conducted by other countries" (Laursen, 1996, p.1135).

Not only has Alberta's education been focused on science, technology, and engineering, it also has been focused on management and innovation. Alberta primary and secondary schools have received high rankings for supporting creativity, self-sufficiency, and personal initiative – which are fundamental for productive and innovative entrepreneurship (Langford and Josty, 2014).<sup>13</sup> In contrast, entrepreneurship education is predominantly promoted through vocational schools in Kazakhstan (OECD, 2014). According to Gerber (2014), providing experiential learning in financial literacy, entrepreneurship, and work readiness in grade school increases the rate of business creation from 9% to 36%. Furthermore, "to a greater or lesser degree in just about every culture there are skeptical or even hostile attitudinal barriers to entrepreneurship. [...] And hence the need for entrepreneurship education aimed specifically at young people, who are typically more open to self-exploration and usually more willing to challenge received wisdom and societal prejudice than are most adults" (World Economic Forum, 2009, p. 30). As a result, it is of paramount importance that Kazakhstan's Ministry of Education and Science implement entrepreneurial studies in their grade school curriculum.

To date, Kazakhstan's diversification has been relatively low in R&D with public policy being an important catalyst. To develop capabilities, Lee (2013) suggests pursuing license-based learning or public-private joint R&D projects. Middle income countries, such as Kazakhstan, "benefit from collaboration with public research labs and universities, overseas R&D outposts, international mergers and acquisitions (M&As) and contracted R&D, all of which should be combined with in-house R&D efforts. ... [Middle income countries] must focus on consolidation of a local basis for knowledge creation and diffusion" (Lee, 2013, p. 254).

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<sup>13</sup> According to Acs, Szerb, and Autio, (2016), Canada ranks as the second highest country in entrepreneurship

after Denmark while Kazakhstan ranks 63rd out of the 73 countries analyzed.

With respect to horizontal diversification initiatives, Kazakhstan needs to focus on improving the physical and institutional enabling framework for private sector activity. One area that Alberta's initiatives were dependent on was well developed and effective intellectual property rights. Johnson, McMillan, and Woodruff's (2002) study of Poland, Romania, Slovakia, Ukraine, and Russia indicates that secure property rights are both necessary and sufficient to induce investment by entrepreneurs, whether they are active in science and technology or agriculture. Furthermore, Radošević and Myrzakhmet (2009) state that the system of intellectual property rights is one of the most important constraints to Kazakhstan's ability to exploit its science and technology potential.

Finally, the diversification strategy that Alberta has pursued is to build around rather than displace its conventional comparative advantages. Furthermore, Government of Alberta policies for the development of the province's oil sands have adhered to most of the best diversification practices outlined by the experts. Therefore, the principal lessons that Kazakhstan can learn from Alberta's diversification experience is i) building upon rather than escaping from its resource-based economy; ii) limiting the number of its vertical diversification initiatives; iii) implementing horizontal policies that address capabilities and strengthen intellectual property rights; and iv) adopting other "best" diversification practices.

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