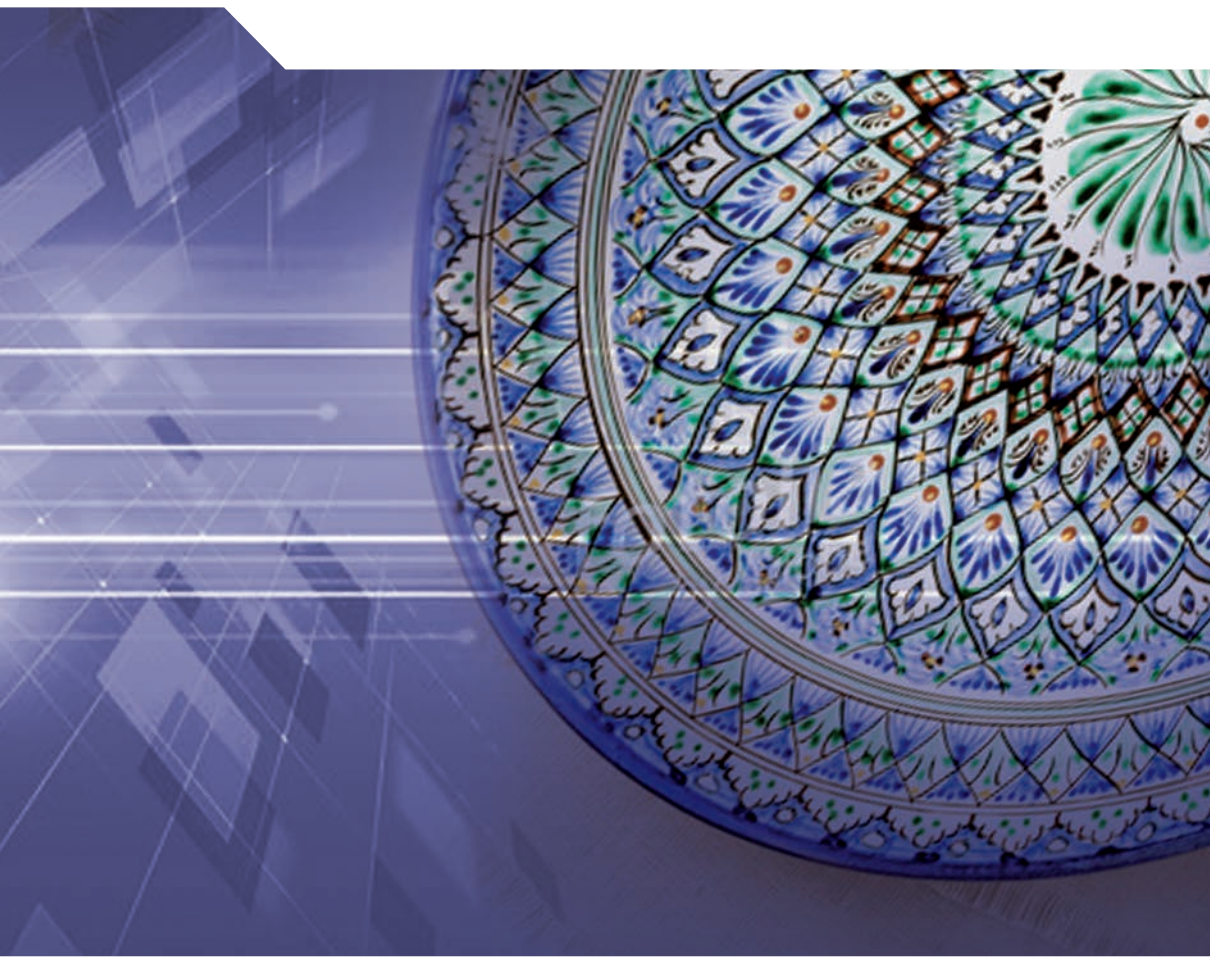
Boosting Kazakhstan's National Intellectual Property System for Innovation



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Foreword

National intellectual property (IP) systems provide a critical policy toolkit for fostering innovation performance and knowledge diffusion. This report is part of a series of country reviews aimed at identifying how national IP systems can better serve these objectives (http://oe.cd/ip-studies). The publication *National Intellectual Property Systems, Innovation and Economic Development* presents the analytical framework used for these country reviews. The framework is used to analyse the key mechanisms that enable IP systems to support countries' innovation and development objectives. This allows strengths and weaknesses in the intellectual property system's contributions to national innovation performance to be identified.

This Review presents an in-depth analysis of Kazakhstan's intellectual property system with regards to its support of the country's innovation performance. On the basis of the analysis, specific policy recommendations on where improvements can be made are formulated. This Review is part of the OECD Kazakhstan Innovation Policy for Competitiveness Project, an initiative that supports Kazakhstan's competitiveness reform agenda. This Review contributes to the perspectives on IP policy in the forthcoming *OECD Review of Innovation Policy: Kazakhstan*. This Review also contributes to the OECD Innovation for Inclusive Growth Project (http://oe.cd/inclusive).

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This Review was carried out in co-operation with the JSC Information-Analytic Center. The Review is part of the OECD Kazakhstan Innovation Policy for Competitiveness Project, which aims to support the competitiveness reform agenda of Kazakhstan, with a focus on enhancing the country's technological and innovation capabilities. In addition to intellectual property rights, the project addresses other critical policy areas, such as access to finance and skills for innovation.

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Acronyms and abbreviations

ARWU	Academic Ranking of World Universities
CISFTA	Commonwealth of Independent States Free Trade Area
EAEU	Eurasian Economic Union
EAPC	Eurasian Patent Convention
EAPO	Eurasian Patent Organization
ECA	Europe and Central Asia
EurAsEC	Eurasian Economic Community
FDI	Foreign direct investment
GDP	Gross domestic product
GERD	Gross expenditure in research and development
GI	Geographical indication
GNI	Gross national income
IP	Intellectual property
IPC	International Patent Classification
KZT	Kazakhstani tenge (currency)
NATD	National Agency for Technological Development
NCSTE	National Center of Science and Technology Evaluation
NCSTI	National Center for Scientific and Technical Information
NIIP	National Institute of Intellectual Property
NU	Nazarbayev University
PCT	Patent Cooperation Treaty
PISA	Programme for International Student Assessment
PPP	Purchasing power parity

PRI	Public research institute
SEZ	Special economic zone
SOE	State-owned enterprise
SME	Small and medium-sized enterprise
STI	Science, technology and innovation
TCC	Technology Commercialization Center
TRIPS	(Agreement on) Trade-Related Aspects of Intellectual Property Rights
TTO	Technology transfer office
USD	United States dollar
USSR	Union of Soviet Socialist Republics
WIPO	World Intellectual Property Organization
WTO	World Trade Organization

Executive summary

Kazakhstan has been among the fastest growing economies in the world since the early 2000s thanks to the exploitation of its oil reserves and mineral resources. However, the country's over-reliance on extractive industries has become a growing policy concern. Promoting innovation has emerged as a key policy priority, as part of the national strategy to foster economic diversification and competitiveness. Improving Kazakhstan's national intellectual property (IP) system can contribute to this agenda.

Kazakhstan's innovation performance and the potential contribution of intellectual property rights

Kazakhstan's national innovation system is at an early stage of development. Gross expenditure in research and development was just 0.2% of gross domestic product (GDP) in 2014. State-owned enterprises or foreign-owned multinational companies dominate most industries and invest little in innovation in Kazakhstan. Small and medium-sized enterprises (SMEs) also innovate little compared to SMEs from other countries in the region. Research conducted at universities and public research institutes rarely reaches the market, due to the low quality of research and its lack of relevance to industry needs, the low demand for research by the business sector, important bureaucratic hurdles, and few incentives for the commercialisation of research results.

For the national IP system to boost performance, a broad approach to IP support is necessary, including utility models and trademarks, since these forms of IP are often more relevant than patents for SMEs. Furthermore, the IP system needs to contribute to inclusive innovation by addressing the needs of the most disadvantaged regions, where a focus on IP for agricultural and traditional products could best serve private sector development.

Overview of Kazakhstan's national intellectual property system

Kazakhstan's national IP system has evolved considerably since the country's independence in 1991, in order to adhere with international provisions. Kazakhstan joined the World Trade Organization (WTO) in 2015

and consequently adopted IP standards as defined in the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS). It has also signed the Patent Cooperation Treaty (PCT) and other important international IP treaties. Kazakhstan is also part of the Eurasian Patent Convention (EAPC), which allows for regional patents with Armenia, Azerbaijan, Belarus, Kyrgyzstan, the Russian Federation, Tajikistan and Turkmenistan. Improving the enforcement of IP rights remains a priority.

Core institutions of Kazakhstan's IP system include the Department on Intellectual Property Rights of the Ministry of Justice, which directs national IP policy setting, and the National Institute of Intellectual Property (NIIP), a state enterprise under the Ministry of Justice, which manages the IP examination and registration procedures. In addition, the Ministry of Education and Science and the Ministry of Investment and Development provide grants and support services to encourage the uptake of IP by universities, public research institutes and the private sector. Implementing agencies include the National Center for Scientific and Technical Information (NCSTI) under the Ministry of Education and Science, which promotes university-industry links and the commercialisation of research results; the Technology Commercialization Center (TCC) under the Ministry of Education and Science, which provides grants, training and support for technology commercialisation; and the National Agency for Technological Development (NATD), which provides support for business innovation.

The use of IP in Kazakhstan is very low by international standards. Most patenting activity is performed at universities and public research institutes, but the proportion of patents which are commercialised is low. For this purpose, new intermediary organisations such as technology transfer offices, science parks and business incubators have been set up during the past decade. On the regulatory front, a new Law on Commercialization of Scientific Activities was approved in 2015, which gives universities more autonomy to commercialise research, as well as incentives for the different actors participating in the technology commercialisation process. In parallel, a larger number of grants for technology commercialisation and business IP have been made available; and the number of IP training courses and awareness campaigns has increased.

Kazakhstan is a net importer of IP, which is consistent with the country's need to catch up with the international technological frontier. IP provides critical information about existing technologies developed globally, and technology screening can help identify what can be useful for national production. Small steps have been taken in this direction, such as the establishment of five small international technology transfer centres, but more efforts to link with foreign sources are necessary in the future.

Main policy recommendations

Streamline the governance of intellectual property policy

- Establish a flexible, non-bureaucratic, high-level council to co-ordinate national IP policies and clearly define the policy responsibilities of each institution involved in promoting the use and commercialisation of intellectual property.
- Adopt a sectoral focus on IP policies, focusing on specific sectors where critical mass can be developed (avoid focusing on high-technology industries only).

Improve the administrative procedures and operations of the National Institute of Intellectual Property (NIIP)

- Provide a more complete, free and user-friendly access to databases and platforms that inform on registered and applied for intellectual property.
- Adopt a service delivery approach that is more customer-centred, by publishing better information on processing procedures and pendency statistics, and providing opportunities for user feedback.

Realign intellectual property policies targeted at universities and public research institutes

- Empower a central agency to promote the commercialisation of intellectual property in Kazakhstan, by co-ordinating and complementing the activity of existing technology transfer offices.
- Develop guidelines and tools, such as model licensing contracts, to facilitate the implementation of the recent Law on Commercialization of Scientific Activities.
- Adjust the incentives structure for public researchers to promote their engagement with industry and their production of relevant IP.

Support the uptake of intellectual property by firms

- Facilitate SMEs' and traditional sectors' use of trademarks, industrial designs and utility models – in addition to patents – through IP awareness campaigns, training and technical support, new grants and tax incentives.

- Promote the sourcing by state-owned enterprises of promising IP generated by domestic public research centres and private firms. To that end, a common platform for public procurement of technology by state-owned enterprises could be created.
- Improve connections with global technology markets, by expanding technology screening activities, promoting the commercialisation of national IP abroad and attracting R&D-related foreign direct investment.

Chapter 1.

Overall assessment and recommendations

This chapter presents an overall assessment of Kazakhstan's intellectual property (IP) system and gives recommendations to help enhance its contributions to innovation. It provides an overview of the context in which IP policy is made, including the legal framework, the policy actors involved in the intellectual property system, and the needs and use of intellectual property by universities and public research institutes, innovators in traditional and informal sectors, small and medium-sized enterprises, state-owned enterprises and multinational firms.

Following its independence in 1991, Kazakhstan, a small economy of 17.3 million inhabitants (2014), has undertaken extensive institutional reforms in its transition to a modern market economy. Kazakhstan joined the group of upper middle-income countries in 2006 as a result of substantial growth. Between 2000 and 2014, the economy grew at an average rate of 7.7% per year, well above that of the OECD area (1.7%) and among the highest growth rates in the world, with gross domestic product (GDP) per capita reaching USD 12 600 in 2014 (at current prices) (World Bank, 2016). Growth was driven by the exploitation of the country's abundant mineral resources, especially oil, in a context of rising global commodity prices. However, the reliance on extractive industries has become a growing policy concern. In 2012, the government launched the Kazakhstan 2050 Strategy, which aims to position the country within the top 30 developed countries by 2050 through building a diversified, knowledge-based economy. Policy actors increasingly recognise that support for innovation is crucial for the country's future economic development.

Kazakhstan's innovation performance is weak. National gross expenditure in research and development (GERD) was below 0.2% of GDP in 2014, a very low rate compared with other countries at similar levels of development (World Bank, 2016). The scarcity of skilled human capital, limited access to finance for innovators, lack of strong science-industry linkages and bureaucratic barriers to doing business remain important impediments to innovation and economic development in the country.

- This context has the following implications for an assessment of Kazakhstan's IP system: a number of different policy instruments are critical to foster innovation in Kazakhstan, and need to be undertaken jointly. The national intellectual property (IP) system provides a set of valuable tools that can help support policy intended to enhance innovation and development. Improvements in innovation performance will in turn strengthen the role IP policy can play to help boost innovation – that is to say, a larger number of highly innovative firms will increase the number of effective users of the IP system. Kazakhstan's current innovation system also raises the need to focus on how IP can help Kazakhstan to catch up to other countries rather than focusing on promoting innovation at the global technological frontier. This includes focusing not only on patents but also on trademarks, utility models and ways to increase actors' awareness of how IP can help support their business activities.

Innovation capacities in Kazakhstan are concentrated in universities and public research institutes (PRIs), which account for over 50% of the country's R&D expenditure. The system of PRIs inherited from the Soviet

era has been reorganised, and the university system has undergone a major transformation in recent years. In contrast to the past, the public research system now focuses more on conducting research, and the adoption of international standards in teaching is changing the contributions these institutions are making to human capital formation. Many challenges remain, however, and additional efforts are necessary to: 1) improve the quality of public R&D and its relevance to industry; 2) enhance the autonomy of universities and reduce unnecessary bureaucracy; and 3) promote science-industry collaboration as well as collaboration among universities and PRIs.

- The role of universities and PRIs has the following implications for Kazakhstan's IP system: IP policy that applies to universities and PRIs should help to enhance their ability to conduct research relevant to industry. Such policy approaches also need to consider reward schemes for researchers. Leveraging the research capacities of these institutions can help support the country's innovation dynamics.

The contribution of small and medium-sized enterprises (SMEs) to the national economy is very low by international standards; SMEs account for around 26.2% of GDP and 33% of employment in 2014. Most SMEs operate in the wholesale and retail sector followed by agriculture, while very few are involved in manufacturing or knowledge-intensive services (Committee on Statistics, 2016). SMEs engage little in innovation: a 2013 Enterprise Survey conducted by the World Bank indicates that only 3.7% of medium-sized and 1% of small firms in Kazakhstan invested in R&D, compared with an average of 11.1% and 8.4% for Eastern Europe and Central Asia.[1]

- The state of development of Kazakh SMEs has the following implications for the national IP system: to support SMEs, the IP system needs to adopt a broader perspective than one focused on patenting, as patenting requires R&D capacities many of these institutions do not have. Utility models and trademarks can support innovation more widely, including incremental types of improvements, as they are more appropriate than patents in many cases.

Most industries are dominated by state-owned enterprises (SOEs), which have based their innovation strategies on importing ready-to-use equipment and technologies from abroad instead of investing in in-house R&D and linkages with local universities and research centres. However, several policy changes provide opportunities, including the fact that the Samruk-Kazyna sovereign wealth fund – the manager of most SOEs – is required by law to invest at least 10% of its net profit in R&D. Future privatisations, if implemented, may also boost the willingness of SOEs to engage in innovation.

- IP policy could build on the new orientation of SOEs towards innovation and facilitate their acquisition of IP through technology transfer by strengthening their co-operation with research institutions.

Inward foreign direct investment (FDI) has increased substantially in recent years but is concentrated mainly in the extractive industries, with hardly any investment in R&D-related facilities. However, R&D by multinational subsidiaries is set to increase in the coming years; this follows the 2012 amendments to mineral legislation, requiring firms active in the subsoil sector to invest at least 1% of their total revenue in R&D activities in Kazakhstan. If implemented, such investments could help Kazakhstan to catch up.

- Developing the country's IP system is also relevant to helping enhance R&D investments. IP policy should focus more closely on attracting foreign know-how and draw on international experience in order to support the country's efforts towards using IP policy to strengthen innovation capacities.

Kazakhstan is a very large country with significant regional disparities in terms of per capita income and well-being. Large portions of the population in peripheral areas still have limited access to drinking water, sanitation, healthcare and education. Such regions also suffer from an underdeveloped local transportation network. Some of the inequalities are due to substantial differences in the country's industrial structure. Agriculture is most important in regions located in the north and south, while regions located in the northeast and centre have developed different types of industries (including extractive industries, steel production and automobile assembly). The two municipal districts of Almaty and Astana are the country's largest cities, and their economies are dominated by services.

- These socio-economic challenges have the following implications for Kazakhstan's IP system: The IP system could contribute to inclusive innovation by implementing IP support policies that address the specific needs and challenges of individual regions. In regions based on agriculture, the use of IP for agricultural and traditional products could best serve business development. This could contribute not only to economic but also social objectives by improving conditions for less advantaged regions.

Governance of the national innovation system is complex, and involves several actors with overlapping mandates. Many new institutions have been established during the past decade, including innovation agencies, technology transfer offices and science parks, as well as national holding companies grouping together PRIs, funding bodies and SOEs. This complex governance

system is still emerging, and co-ordination among the different actors with responsibility for science, technology and innovation (STI) policies needs to be streamlined. In particular, the division of competencies in STI policy between the Ministry of Education and Science and the Ministry of Investment and Development has led to a dual state support structure for STI that does not always co-ordinate its policy mix in a coherent manner.

- The governance of the IP system should be improved, with increased co-ordination among actors involved in IP policy; institutional overlaps should be addressed in order to avoid unnecessary duplications and complexity.

1.1. Overview of Kazakhstan's intellectual property system

1.1.1. Legal framework

The legal and regulatory framework of Kazakhstan's IP system has improved substantially in the past years. Since its independence in 1991, the country's IP regulations and institutions have been enhanced, adopting international standards. The country joined the World Trade Organization (WTO) in 2015 and consequently adopted IP standards as defined in the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS). The country has also signed key international conventions and treaties related to IP, including the Patent Cooperation Treaty (PCT), as well as regional and bilateral IP treaties, notably in the context of its membership of the Eurasian Economic Union (EAEU).[2] In addition, since 1995 Kazakhstan is party to the Eurasian Patent Convention, together with Armenia, Azerbaijan, Belarus, Kyrgyzstan, the Russian Federation, Tajikistan and Turkmenistan. This convention allows an inventor to file a Eurasian patent application with the Eurasian Patent Office, in addition to the alternative of filing a patent in Kazakhstan only or filing a patent under the PCT.

Basic provisions on intellectual property rights protection are defined in Kazakhstan's Civil Code. In addition, the country has developed three major IP laws: the Patent Law (1999), regulating patents, utility models and industrial designs; the Law on Trademarks, Service Marks and Appellations of Origin (1999); and the Law on Copyrights and Neighbouring Rights (1996). These laws have been amended several times to comply with the requirements of international treaties to which Kazakhstan is party.

1.1.2. The use of intellectual property in Kazakhstan

Kazakhstan's residents use IP little by international standards, with limited signs of increasing use over the past decade. Resident patent applications per million population, for instance, were at around 100 per year between 2004

and 2014, a much lower figure than in the Russian Federation (167 in 2014) or the People's Republic of China (587 in 2014; hereafter "China"). Moreover, patent filings in foreign offices by residents of Kazakhstan have been almost negligible, pointing to the weak commercial value of Kazakh inventions in international markets. The Eurasian Patent Organization (EAPO) and the Russian Federation are the top destinations for Kazakh applicants abroad, with an average of 42 and 24 filings per year between 2007 and 2014, respectively (WIPO, 2015).

With regard to other types of IP, trademark applications by Kazakhstan's residents have remained relatively stable since 2000, with nearly 150 per million population in 2014 (WIPO, 2015). Utility models and industrial designs are very infrequently used, in spite of their potential relevance for the country's innovation system at its current stage. As of December 2015, there were 37 geographical indications (GI) registered in Kazakhstan's IP office. Most of them correspond to foreign products and were granted after 2011, illustrating the very recent uptake of GI in Kazakhstan.

Consistent with the country's need to catch up with the international technological frontier, Kazakhstan is a net importer of intellectual property. In 2013, the country paid USD 148 million in royalties and licensing fees, up from USD 31 million in 2005. However, only 9.3% of firms in Kazakhstan use technology (excluding office software) licensed from abroad (and only 5.2% of small firms), which is below the average of 14.6% among countries in Europe and Central Asia (World Bank, 2014).

Most patenting activity in Kazakhstan is performed at universities and PRIs (and is concentrated in only a few of them), accounting for 54% of total patents granted in Kazakhstan in 2015. However, the proportion of these patents that results in products that reach the market is low: in 2014, there were just 14 resident patent licensing agreements in Kazakhstan (NIIP, 2015). Accounting for this is a combination of low awareness of IP, a lack of science-industry links, bureaucratic barriers to such interactions and an inadequate incentives structure for inventors.

In general, business engagement in innovation is weak, and consequently the private sector's use of IP is rare. The largest, albeit small, share of business R&D activities is conducted by SOEs. As noted above, SOEs have so far mostly sourced their technologies from abroad, as have subsidiaries of foreign multinationals, mostly concentrated in the extractive industry. Meanwhile, Kazakhstan's SMEs hardly use patents or other forms of IP rights as they lack the capacity to develop or adopt advanced technologies. In most cases, SMEs are not aware of the benefits of different types of IP, such as trademarks, that could be relevant for their sector. As is the case for SMEs in many countries, the enforcement costs of IP rights might also be

perceived as being too high. Moreover, Kazakhstan has a rich tradition in handicrafts and textiles, sectors that have to date practically not been exploited commercially. Similarly, mechanisms to protect and promote business models based on traditional knowledge, important genetic resources and traditional cultural expressions, have so far not been explored.

1.1.3. Policy actors in the intellectual property system

Kazakhstan's national IP system involves many different actors, as shown in Table 1.1. The diversity reflects the different functionalities involved, which include IP governance, IP administration and enforcement, and IP policy in support of IP use.

At the heart of the legal and administrative system is the Department on Intellectual Property Rights of the Ministry of Justice, which directs national IP policy and its implementation. The National Institute of Intellectual Property (NIIP), a state enterprise under the Ministry of Justice, manages the IP examination and registration procedures, and conducts awareness campaigns. The State Commission for Crop Variety Testing of the Ministry of Agriculture is responsible for the registration of plant variety and animal breed selection achievements, and a committee under the Ministry of Healthcare and Social Development deals with the interaction between public health and intellectual property.

Several institutions are involved in IP support policies for different user groups. Most importantly, the Ministry of Education and Science and the Ministry of Investment and Development are in charge of overseeing these policies, including grant programmes aimed at universities and higher research institutions and companies. Implementing agencies include the National Center for Scientific and Technical Information (NCSTI) under the Ministry of Education and Science, which promotes university-industry links and the commercialisation of research results; the Technology Commercialization Center (TCC), created in 2013 as part of the World Bank Technology Commercialization Project (2010-15),[3] which provides grants, training and support for technology commercialisation; and the National Agency for Technological Development (NATD), which provides grants, technology business incubation and commercialisation services, venture financing, as well as support for different forms of innovation infrastructures, including by providing support to different users for the use of IP. In addition to public agencies, as is the case in other countries, registered patent solicitors and IP evaluators play an important role in supporting firms and research institutes in the registration and enforcement of IP rights.

Table 1.1. **Kazakhstan's intellectual property system: An overview of the institutions involved**

Role	Institution
Intellectual property governance	– Department on Intellectual Property Rights of the Ministry of Justice (formerly the Committee on Intellectual Property Rights) – National Institute of Intellectual Property, an independent legal body under the Ministry of Justice (for industrial property)
Intra-governmental consultation on intellectual property	– Foreign Investors' Council
Intellectual property administration	– National Institute of Intellectual Property (for industrial property) – Department on Intellectual Property Rights (for copyright) – State Inspection for Pedigree Breeds and the State Commission for Crop Variety Testing of the Ministry of Agriculture (plant varieties and animal breeds)
Intellectual property policy and support policies for intellectual property use	– Committee of Science of the Ministry of Education and Science – Ministry of Investment and Development – Department of International Economic Integration of the Ministry of National Economy – "National Agency for Technological Development" Joint Stock Company under the Ministry of Investment and Development – Technology Commercialization Center (TCC) under the Ministry of Education and Science[1]
Other entities of the intellectual property system	– Ministry of the National Economy (for IP trade agreements) – Committee for the Control of Medical and Pharmaceutical Activities of the Ministry of Healthcare and Social Development (for IP matters related to pharmaceuticals) – Registered patent solicitors and IP evaluators
Intellectual property enforcement	– Ministry of Justice, courts and police – Customs Control Department of the State Revenue Committee of the Ministry of Finance – Service of Economic Investigations under the State Revenue Department of the Ministry of Finance – Criminal Police Department of the Ministry of Internal Affairs

1. The World Bank Technology Commercialization Project concluded in December 2015, but a follow-up World Bank project entitled "Fostering Productive Innovation" (2016-20) is under way. This will guarantee the continuation of the TCC, and also comprises some additional instruments, such as the creation of an early-stage venture capital fund.

There is limited cross-governmental consultation on IP matters to streamline policy approaches in this field. The Foreign Investor's Council (FIC) is an advisory body that aims to facilitate dialogue between different governmental institutions and foreign companies in Kazakhstan, including discussions on IP matters.

Other institutions participate in the international orientation of Kazakhstan's IP system, including the Ministry of National Economy, which led negotiations regarding the implementation of TRIPS.

1.1.4. Intellectual property policy developments

In recent years, the government has launched several initiatives to encourage the commercialisation of public research. IP policies are focused on the public research sector, and specifically patenting. A few efforts are aimed at supporting IP in the manufacturing industry, while only limited support has been provided for the uptake of IP in agriculture and traditional sectors, including handicrafts and textiles (e.g. jewellery, embroidered cloths and traditional dresses). This is the case in spite of the fact that agriculture and the extractive industries are two sectors in which the country has a comparative advantage. New intermediary organisations such as technology transfer offices (TTOs), science parks and business incubators, have been set up. On the regulatory front, the new Law on Commercialization of Scientific Activities, approved in October 2015, gives universities more autonomy to commercialise research, and clarifies the rights of, and provides incentives for, the different actors participating in the technology commercialisation process (see also OECD, forthcoming b). Much will depend on how the new law is implemented. Providing long-term support to fund and build the capacities of TTOs is critical for the success of these support institutions.

To encourage the use of IP by industry, the IP registration fees for SMEs have been reduced;[4] a larger number of grants for technology commercialisation have been made available; and the number of IP training courses and awareness campaigns has increased. Other initiatives that may lead to further IP uptake in the longer run include incentives for foreign multinationals to conduct more R&D in the country, as well as the requirement for state-owned enterprises to invest more in R&D.

1.2. Identification of intellectual property policy priorities for Kazakhstan

The necessary legal and regulatory framework for a well-functioning IP system is in place in Kazakhstan. However, there are significant weaknesses, particularly with regard to the enforcement of IP rights and co-ordination among the actors involved in IP policy design and implementation. There are challenges to spreading the use of IP rights across different groups of users, particularly those that are currently less prone to developing or adopting new technologies.

The next section provides a detailed list of 22 recommendations that, if implemented, would help enhance the contribution of the IP system to innovation. The different recommendations are to a large extent complementary, and greater effects are expected if all of them are undertaken together, as part of a comprehensive policy mix.

Implementing all of the reforms at the same time may, however, prove challenging. In order to facilitate the process of implementation, four key IP policy priorities should be focused on. For each of the four, a number of recommendations have been identified. These are outlined in Table 1.2, where the most important recommendations are highlighted in bold.

The four key IP policy priorities are discussed below.

Firstly, improve intra-governmental co-ordination of IP policy design and implementation. This requires the establishment of an IP policy co-ordination body and a clear delineation of the responsibilities of each actor in the system, in order to avoid overlaps (Recommendations 2 and 3). These measures are essential to ensure IP policy coherence, as well as to enhance policy effectiveness and increase efficiency in the use of public resources.

Secondly, facilitate the use of trademarks, industrial designs and utility models – in addition to patents – by SMEs and traditional sectors, with the aim of developing an innovative private sector and fostering the access of SMEs and traditional sectors to relevant IP (including from abroad). To that end, a range of measures targeted at private sector firms should be implemented, including the provision of IP awareness campaigns, training and technical support, as well as the introduction of new grants and tax incentives (Recommendations 13, 14, 15, 16 and 21).

Thirdly, adapt IP policies currently targeted at universities and PRIs to enhance their contribution to private sector development. In particular, incentive structures for public researchers should be adjusted to promote their engagement with industry and their production of quality, relevant IP (Recommendations 10, 11 and 12). Such incentives should be accompanied by efforts to strengthen and concentrate commercialisation capacities in a single institution, able to co-ordinate the activity of current TTOs and establish international linkages (Recommendations 7 and 8). Such international linkages should foster Kazakh firms' access to foreign technologies and lay the ground for future commercialisation of national technology abroad (Recommendations 18 and 19). Several guidelines and tools should also be made available to facilitate public research commercialisation (Recommendation 9). Finally, increasing public procurement of public research by SOEs can help commercialisation from the demand side (Recommendation 17).

Table 1.2. **Overview of policy recommendations by priority**

Key priorities	(1) Intellectual property policy co-ordination	(2) Private sector access to intellectual property (beyond patents)	(3) Commercialisation of public research and private sector development
Recommendations	**– Improve intra-governmental co-ordination of IP policy design and implementation (r.2)** **– Define the IP policy responsibilities of each institution engaged in the IP system (r.3)**	**– Provide IP training and technical support to small and medium-sized enterprises (r.14)** **– Support the creation of trademarks for food products and traditional handcrafts (r.16)** – Support policies focused on SMEs and traditional sectors (r.13) – Create a new prize for innovative small, and medium-sized enterprises actively using IP (r.15) – Foster the use of franchises in the food and textile sectors (r.21) – Promote sourcing of Kazakh technologies by state-owned enterprises (r.17)	**– Develop guidelines and tools to facilitate commercialisation (r.9)** **– Reform researchers' rewards system to incentivise research commercialisation (r.11)** **– Introduce new performance measures for university funding (r.10)** **– Empower a central agency to promote IP commercialisation (r.8)** – Support spin-off creation conditional on quality (r.12) – Strengthen the quality of technology transfer office services (r.7) – Promote sourcing of Kazakh technologies by state-owned enterprises (r.17) – Expand the technology screening activities of the National Agency for Technological Development (r.18) – Connect with global technology markets (r.19)
Cross-cutting priority	(4) Sectoral approach to IP policies To be developed across the priority areas and specifically in the following: – Empower a central agency to promote IP commercialisation, building expertise in specific sectors (r.8) – Foster the use of franchises in the food and textile sectors (r.21)		
IP processing	**– Provide free, user-friendly information on registered and applied for intellectual property in Kazakhstan (r.4)** **– Publish information on the National Institute of Intellectual Property's processing procedures and pendency statistics (r.5)** – Improve the information system on IP transactions to facilitate the future development of markets for technology (r.6)		
Beyond IP policy	– Implement complementary innovation policies (r.1) – Use the improvements in the IP system to attract R&D-related foreign direct investment (r.20)		

Note: The numbers following each recommendation stand for the number of the corresponding recommendation as listed in the next section. Text in bold indicates that the related recommendation is a priority.

Fourthly, adopt a sectoral focus with respect to IP policies, to strengthen their effects on innovation. Industries in Kazakhstan differ considerably in terms of their productive and research capabilities, with the main strengths currently in the agricultural sector and the mining industry. Other sectors, such as textiles, have a long tradition in the country. To maximise the success of IP policy, it would be useful to initially focus on specific sectors, and avoid focusing solely on high-technology sectors. This is a cross-cutting priority, implying that sectoral considerations can be taken into account when implementing other recommendations presented in this Review. Examples include the development of sectoral expertise on IP commercialisation, or the provision of technical support to foster the expansion of franchises in specific sectors (Recommendations 8 and 21).

These priorities arise in a context where legal conditions for IP are already in place, although certain improvements in terms of procedures should be considered (Recommendations 4, 5 and 6), mainly to ensure public access to information on IP registrations and IP processing procedures in Kazakhstan. In turn, the improvement of Kazakhstan's IP system resulting from the range of reforms described in this chapter should help attract R&D-related FDI (Recommendation 20).

A longer term objective is to establish a system to record IP transactions. This is a crucial step towards establishing a methodology for IP valuation in order to enable markets for commercialisation (Recommendations 6 and 22).

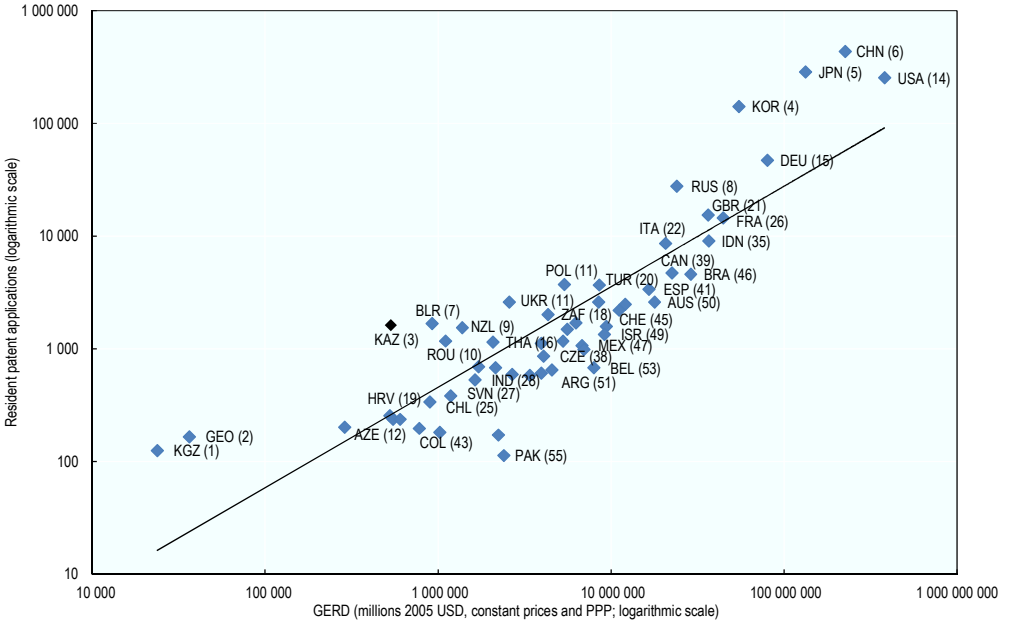
1.3. Detailed recommendations for Kazakhstan

1.3.1. Intellectual property policies and innovation capacities

Recommendation 1. Concerted policy efforts aimed at developing a stronger innovation ecosystem are necessary.

IP policies can be a powerful tool for promoting innovation, and a set of recommendations to improve the current policy design in that domain is provided below. However, for IP policies to fulfil their potential impact, concerted efforts are necessary to strengthen the national innovation system. In fact, the volume of resident patent applications corresponds to Kazakhstan's low level of R&D spending (Figure 1.1). Several broad innovation policy areas are relevant. First, improving research excellence would strengthen the base of knowledge that can be commercialised; the forthcoming *OECD Reviews of National Policies for Education: Higher Education in Kazakhstan* (OECD, forthcoming b) *will provide recommendations on this. Second, improvements* in human capital, on both the research and industry sides, are crucial to foster innovation.

Figure 1.1. **Resident patent applications and gross domestic expenditure on R&D (GERD), five-year average, 2009-13**



Notes: A resident application is an application filed with an IP office by an applicant residing in the country/region in which that office has jurisdiction.

A ranking of "resident patent applications per GERD" out of 55 offices for which data are available is displayed in brackets.

Resident patent application and GERD data are five-year averages for 2009-13, except for Argentina (GERD for 2012); Australia (average GERD for 2008, 2010 and 2011); Brazil, Chile, Hong Kong (China), Ireland, Malaysia, Singapore, South Africa, Switzerland and the United States (GERD for 2008-12); Georgia (GERD for 2013); India (GERD for 2007-11); Indonesia (GERD for 2009 and 2013; resident patent applications for 2009-13 except for 2012); New Zealand and Thailand (GERD for 2007, 2009 and 2011); Korea (resident patent applications for 2009-12); Kyrgyzstan (GERD for 2007-11); Pakistan (GERD for 2009, 2011 and 2013; resident patent applications for 2010-13); Slovenia (resident patent applications for 2007-11).

Sources: OECD calculations based on WIPO (2015), *WIPO Statistics* (database), www.wipo.int/ipstats/en#data; OECD (2015), *Main Science and Technology Indicators* (database), http://stats.oecd.org/Index.aspx?QueryId=33210; UNESCO (2015), *UIS.Stat* (database), http://stats.uis.unesco.org; NIIP (2013), *Annual Report 2013*, http://kazpatent.kz/2013_annual_report for 2012 resident patent applications data.

Third, despite recent progress in easing business and investment, for instance via the creation of new businesses, further improvements of private sector innovation activities are still needed. The OECD Kazakhstan Innovation Policy for Competitiveness Project supports this competitiveness reform agenda, with a focus on technological and innovation capabilities.

Fourth, a sectoral focus on natural resources and agricultural products is warranted, concentrating efforts on what is currently an early-stage innovation system. The *OECD Reviews of Innovation Policy: Kazakhstan* (OECD, forthcoming a) will provide detailed recommendations aimed at strengthening the national innovation system.

1.3.2. Governance of intellectual property policies

Recommendation 2. Improve intra-governmental co-ordination of IP policy design and foster exchange on existing programmes by establishing a flexible, non-bureaucratic high-level council.

A high-level council would bring together representatives from the different government agencies engaged in IP policy (including the Department on Intellectual Property Rights of the Ministry of Justice, the NIIP, the TCC and the NCSTI) and in promoting the use of IP for business innovation (the NATD), as well as other stakeholders such as universities, state-owned companies, private firms and foreign multinationals operating in the country. This co-ordinating council should be flexible and not introduce unnecessary bureaucratic hurdles to an already complex administrative system. Initially, this could take the form of an annual meeting to discuss IP matters that promote innovation, beyond IP regulations and enforcement issues. The main advantage would be a wider exchange of information on relevant policy initiatives. The first meeting of this council could be dedicated to discussing the recommendations set forth in the present Review and setting priorities for action. As an example, Colombia's Intersectoral Commission for Intellectual Property, created in 2010, has contributed to improving the co-ordination of the Colombian national IP system (OECD, 2014).

Recommendation 3. Clearly define the policy responsibilities of each institution involved in promoting IP use and commercialisation, and establish joint programmes where expertise is best combined.

The National Agency for Technological Development (NATD), established in 2003 under the Ministry of Investment and Development, and the Technology Commercialization Center (TCC), established in 2013 with the support of the World Bank under the Ministry of Education and Science, have the capacity to lead the promotion of IP commercialisation. To avoid duplication and exploit synergies, the NATD and the TCC should work in tandem on joint programmes in support of the commercialisation activities of the research outcomes produced by universities and PRIs. This would bring the expertise on public research from the Ministry of Education and Science together with the innovative business development perspective of the NATD.

The national patent office (National Institute of Intellectual Property, NIIP) should focus on providing support and training on legal and procedural matters regarding IP registration, enforcement, and engaging in IP awareness initiatives targeting the public. The NIIP already organises regular seminars and training activities both for patent attorneys and other interested stakeholders; these activities should continue and possibly be broadened where specific needs arise. The NIIP should also be in charge of ensuring that Kazakhstan has solid regulatory frameworks in place, and that information on IP registered in Kazakhstan is readily available (Recommendation 4). Moreover, building on its recent accomplishments, the National Center for Scientific and Technical Information (NCSTI) of the Ministry of Education and Science can contribute to developing more elaborated platforms to foster industry-science linkages.

1.3.3. Procedures and operations

Recommendation 4. The National Institute of Intellectual Property should provide free, open and user-friendly access to information on IP registered and applied for in Kazakhstan, while providing guidelines on how to access other relevant platforms.

While summarised information is disclosed through annual reports and monthly newsletters, access to the NIIP's database with full information on IP in Kazakhstan is not currently available in a user-friendly format. Since 2010, the official NIIP website (www.kazpatent.kz) provides free access to information on registered IP objects. However, information on IP applications is not provided; in addition, no English translation is offered, which could be of relevance to foreign investors. A more user-friendly platform, allowing a search by different fields and access to the full information, is needed. Efforts to create a comprehensive, user-friendly and solid database in English would improve the current situation substantially. Building that database using the available NIIP infrastructure should be the main priority before investing in more ambitious platform projects, as the latter will decisively benefit from such baseline infrastructure. Moreover, the information provided through the NIIP web portal should extend beyond Kazakh IP to include links to information on Eurasian patents as well as other international databases (from the World Intellectual Property Organization, the European Patent Office, the US Patent and Trademark Office, etc.). This would require providing appropriate guidelines and a comprehensive overview of what can be found where, with links from the NIIP site to those various sections. Collaboration with international IP offices may be helpful in that respect.

To complement and enhance the information provided by the NIIP, the NCSTI is developing a project called "Map of the Results of Scientific and

Intellectual Activity of the Republic of Kazakhstan" (intellmap.kz), with the aim of providing entrepreneurs, innovators and scientists with relevant information regarding the national innovation system of Kazakhstan and the ongoing innovation projects through a single website. The website is currently available in test run mode and is expected to include an interactive map of the main organisations comprising the national innovation system in Kazakhstan and their projects, including a database on their IP. Efforts should continue towards fully developing this platform.

Recommendation 5. The National Institute of Intellectual Property should collect and publish information on its processing procedures and pendency statistics as well as solicit and react to user feedback, according to best practices from intellectual property offices worldwide.

Ease of use of IP services is a precondition for the development and uptake of IP, because cumbersome services can discourage use significantly. An effective way to achieve this ease is to adopt a customer-centred service delivery approach. This entails creating opportunities for user feedback and acting in response to any shortcomings users identify. It also requires producing a set of performance indicators on timeliness (e.g. average pendency for the first office action, average pendency for final decision, etc.) and the quality of procedures, and making them available to the public; these would inform ongoing improvement efforts.

Improved monitoring and benchmarking of performance indicators would also help position the NIIP with its counterparts in the Eurasian region and beyond. In particular, such efforts should focus on streamlining processes and pendency times, as well as evaluating the rationale for particular IP registration and continuation fees. In addition, a growing number of national patent offices around the world have become more transparent and are publishing pendency indicators, including China, Germany, Japan, Korea, Mexico, the Russian Federation and the United States, among others (see WIPO, 2015). Most patent offices have also established information systems to obtain and react to user feedback. The NIIP has introduced a Q&A section on its official website (www.kazpatent.kz) to provide answers to questions raised and to react to complaints from users. Such efforts should continue and result in measures being undertaken to integrate complaints. China's experience in this respect might be useful: in 2011, the Chinese patent office successfully established a patent examination complaints platform to collect and handle users' feedback and complaints, with the aim of improving services.

Recommendation 6. The National Institute of Intellectual Property should improve the system for registering IP transactions.

Collecting and disseminating information on IP transactions (including the pricing of licences and changes in ownership) can facilitate the commercialisation of IP by providing a reference for market-based valuations. But even countries with the most advanced IP systems face the challenge of incomplete information on IP transactions. Incorporating such a reporting system is more straightforward for an emerging system where IP is rarely used, as in Kazakhstan. While this will not have immediate returns, building such a reporting system would be useful for the future, leading to better information systems than what is currently available in many advanced economic contexts.

In Kazakhstan, licensing agreements are registered, while contracts dealing with the transfer of IP rights are not. While information on the registered licensing agreements is published on a monthly basis in the NIIP newsletter, building a database on the NIIP website that enables a search for a particular contract by name of actor, name of IP and number of registrations, as is already available for registered IP objects, would also be useful. Moreover, according to some of the law firms interviewed for this Review, there is room for rendering the registration procedures for licensing contracts less complex.[5] To address these shortcomings, the registration of IP transactions should be adapted to international best practice.

1.3.4. Adapting the intellectual property system to users: Universities and public research institutes

Recommendation 7. Strengthen technology transfer office (TTO) services, promoting collaboration and synergies among them as well as establishing linkages with international associations of TTOs.

The commercialisation of public research in Kazakhstan is still in its infancy; it requires critical support from TTOs and other such services to help researchers engage in the registration of IP and its subsequent commercialisation. Since 2011, over 20 TTOs have been established in the country's most important universities and PRIs. Rather than investing in small, often insufficiently prepared TTOs, it will be more meaningful to consolidate TTOs' activities by supporting a few regional-level institutions that could bring together a group of experts in the field with whom stakeholders can consult. This is not feasible for each individual university TTO.

Concrete ways of doing so include creating a national association of TTOs, to better pool resources, focusing on sharing good practices and developing joint training activities, while developing links with international

associations of technology transfer professionals (such as the US-based Association of University Technology Managers or the European Technology Transfer Offices Circle). Examples of national associations of TTOs in other countries include the UNITT in Japan, RedOTRI in Spain, AURIL in the United Kingdom and the Réseau CURIE in France. The creation of an association of TTOs from the member countries of the Eurasian Patent Organization would also be an interesting option to explore for a more international perspective.

Recommendation 8. Empower a central agency to promote IP commercialisation in Kazakhstan, by co-ordinating the activity of other technology transfer offices and building sectoral expertise in agriculture and the mining industry.

Nationally, an institution building on the experience of the Technology Commercialization Center could play a meaningful role in efforts to foster collaboration among national TTOs and enhance international linkages, as discussed in Recommendation 7. Ideally, an existing institution could take charge of this activity, as creating a new agency is costly and would only be successful in the long term. Such an approach would allow the technical capacities needed for the commercialisation of public research to be concentrated in one agency.

To enhance this agency's impact, it would be advisable to have sectoral expertise within that institution, given the differences in the commercialisation processes from one sector to another and the need for specialised employees with experience and networks in specific sectors. Initially, the focus should be placed on agriculture and mining, which are the two areas where Kazakhstan holds clear competitive advantages and potential to build critical mass to develop new technologies with a global reach. In the short term, such efforts to build sectoral expertise could take the form of specialised committees bringing together representatives from universities, PRIs, firms and other experts, in addition to in-house staff.

In the future, more ambitious strategies can be developed. With stronger industry demand, the government could consider the possibility of setting up independent technology transfer offices with a sectoral focus, possibly based on an association of several universities and research institutes. An interesting example in this respect is the Hubs of Technology Transfer programme in Chile, launched in 2015 to develop autonomous technology transfer offices focusing on three strategic sectors, through the association of at least six universities and PRIs.

Recommendation 9. Develop guidelines and tools such as model licensing contracts to implement the recent Law on Commercialization of Scientific Activities.

The Law on Commercialization of Scientific Activities, introduced in October 2015, is a step in the right direction towards creating conditions for the commercialisation of public research. It grants universities and PRIs the right to commercialise their research results and provides general rules regarding the distribution of the resulting royalties and income between the inventor and the employing institution. But to ensure the efficient implementation of this law in practice, further technical support, guidelines and outreach efforts are necessary.

Guidelines on international best practice in IP licensing can similarly be helpful in reducing barriers to implementing the Law on Commercialization of Scientific Activities. For instance, a set of model contracts for industry-university collaborative projects can facilitate industry-university agreements, as lack of knowledge on how to proceed may hamper such collaborations. An interesting example is the Lambert toolkit in the United Kingdom; this toolkit comprises a set of guidelines and model contracts regarding the distribution of IP rights generated within university-industry research consortia. A recent evaluation found that providing these model contracts indeed facilitated collaboration. The guidelines and handbook for promoting university-business links developed in the European context under the "Responsible Partnering Initiative and University-Business Collaborative Research" project by the European University Association and other partners can also be useful.[6]

Recommendation 10. Introduce new performance measures for the allocation of university funding, based on evaluation methods that take into account the quality of the IP produced and its relevance to industry.

The funding system of Kazakhstan's public universities and PRIs is slowly shifting away from the block-funding approach that characterised central planning decision making in the Soviet era towards a more competitive, performance-based funding system. In the future, it would be advisable to improve the criteria for providing university funding, including not only indicators of the number of students, number of publications and number of patents, but also other measures that reflect interactions with industry, such as licensing agreements reached and/or income from collaborations with industry. The forthcoming *OECD Reviews of National Policies for Education: Higher Education in Kazakhstan* will discuss these criteria in further detail (OECD, forthcoming b).

Recommendation 11. Introduce a clear and transparent incentives structure for university professors and researchers that rewards them for licensing, participating in successful spin-off activities and engaging with the private sector.

Researchers' incentives to generate IP and commercialise it are dependent on the certainty of monetary rewards granted to researchers who engage with industry. Lack of clarity as to whether royalties generated from technology commercialisation will accrue to researchers, and whether researchers will benefit from participating in university spin-offs or engaging with industry, are a major hindrance for technology commercialisation in Kazakhstan. The new Law on Commercialization of Scientific Activities is a first step in the right direction, but needs to be adequately implemented within each institution.

Beyond monetary incentives, reputational or career-oriented incentives are equally important factors that motivate researchers. A particularly powerful incentive is to introduce into academic selection processes and tenure track systems rewards to researchers who build linkages with industry; mobilise research funds from private sources; earn income from patent licensing; and participate in spin-offs. Several countries have engaged in efforts to facilitate mobility: both Brazil and Malaysia, for instance, have introduced new regulations that allow researchers from universities or PRIs to take a sabbatical if they want to create a spin-off company. The forthcoming *Reviews of National Policies for Education: Higher Education in Kazakhstan* will provide specific recommendations on this topic (OECD, forthcoming b).

Recommendation 12. Support spin-off creation conditional on the quality of the invention and revealed industry or public sector interest (i.e. potential for commercialisation) in the business. Such support should also involve encouraging opportunities for researchers to engage in spin-offs.

In the absence of a strong innovative private sector, it is challenging to find private sector actors willing to commercialise public research. In this context, encouraging entrepreneurship that is nurtured within universities, as is the case with spin-offs, can be a more fruitful avenue. However, one of the risks of supporting spin-off activities is that they may not be commercially promising ventures and ultimately result in wasting public resources that will not lead to innovation. To reduce such risk, funding should focus to a larger extent on activities that have received commitments from industry or public sector financing (the latter in the context of public procurement). Ongoing monitoring of the commercial potential is necessary, and clear mechanisms for the discontinuation of funding in case of negative appraisals should be established.

1.3.5. Adapting the intellectual property system to users: SMEs, informal/traditional sectors and leading firms

Recommendation 13. Support policies should focus on developing the private sector and its innovation activities, including the uptake of IP rights. Besides patents, policy support should aim at promoting the use by firms of other forms of IP, including trademarks, industrial designs and utility models.

The lack of an innovative private sector in Kazakhstan is a serious challenge for innovation. This requires further support policies, including with regards to intellectual property. Existing IP training and support initiatives addressed to firms should be streamlined and expanded, shifting away from current policies that focus almost exclusively on universities and PRIs. New types of grants and tax incentives for firms should be introduced, ensuring that such support will not place smaller businesses at a disadvantage. IP policies should not be limited to patents, but extend further to other forms of IP. In particular, encouraging the use of trademarks to signal a product's quality can be of special relevance at this stage.

Recommendation 14. Provide training courses, awareness campaigns and technical support to promote the use of IP by SMEs, traditional sectors and the general public in all regions of the country.

Low awareness of IP on the part of both business and the general public and the lack of IP culture need to be addressed to facilitate the use and recognition of IP. In addition, it would be useful to provide targeted support to businesses, by helping them identify how registering or sourcing IP can support their business strategy. More targeted and hands-on advice can often bring about real change in businesses' adoption of IP. This requires building a broader base of trainers and experts.

An interesting example along these lines is the "Propiedad Intelectual Colombia" project (2010-14), financed by the Inter-American Development Bank and the Colombian Chambers of Commerce (OECD, 2014). This project provided direct specialised IP consulting services to over 400 micro, small and medium-sized firms in different regions of the country. Evaluation of the programme found that most firms experienced increases in revenue and in the value of their trademarks. The project also supported the development of simplified IP application procedures and online modules for trademarks and patent applications, as well as various tools to inform businesses about the strategic value of IP. This led to an increase in the number of patent and trademark filings in the country. Innovation vouchers have been used across numerous countries as a tool to promote innovation in SMEs, and they could also be useful in Kazakhstan as a mechanism for SMEs to obtain specialised IP support.

Recommendation 15. Expand the Shapagat annual competition for inventors to include a new prize category for innovative SMEs actively using intellectual property, for instance, for the best trademark. Similar support measures could be included in the Sheber contest for Kazakh artisans.

Prizes help support awareness-building campaigns by suggesting best practice, and they are attractive to firms as they can draw public attention to their business. Introducing IP in the context of existing competitions (such as the Sheber contest for artisans) would be an easy way to achieve this objective. Likewise, expanding the well-established Shapagat competition for inventors to more traditional sectors and to other forms of IP besides patents would help raise awareness of the broader contribution that IP can provide across the economy.

Recommendation 16. Promote the creation of trademarks for Kazakh food products and traditional handcrafts, and the adoption by farmers of food safety standards and certifications.

Certifications and standards linked to environmentally friendly, ecological, organic and fair trade products could be used to introduce a stronger emphasis on quality in Kazakh food products. Such specialisation could allow higher prices to be established for quality food products and further opportunities to be explored for the country to serve the large Chinese and Russian markets in particular. Attaining these objectives would require collective efforts aimed at ensuring there is relevant research designed to tackle challenges regarding the quality of food production, undertaking product quality evaluations, and developing and marketing trademarks to reflect quality.

Recommendation 17. Promote the sourcing by state-owned enterprises of promising IP generated by public research and private firms.

The Samruk-Kazyna sovereign wealth fund, which controls most SOEs in Kazakhstan, is obliged by law since 2011 to invest at least 10% of its net profit in R&D. In order to maximise the impact of these important funds on Kazakhstan's innovation system, it could be relevant to use them to create demand for local IP by sourcing external solutions. This could be done via open calls for proposals facilitating public and national industry contributions to technology challenges. To achieve this, a common platform for technical solutions sought by SOEs could be created so that local stakeholders can easily see whether they have technology solutions to offer and propose them to the SOEs. Selection should be made on the basis of a well-established evaluation system (Recommendation 22).

1.3.6. Building intellectual property markets and connecting to the global technology base

Recommendation 18. The National Agency for Technological Development should expand its technology-screening activities so as to match local technology demands with available foreign technologies. It should also provide support to adapt such technologies to local conditions when needed.

Over the past decades, efficient absorption of foreign technology has proved critical for catching-up strategies in countries such as Korea and Singapore. IP provides critical information about existing technologies developed globally, and technology screening can help identify what can be useful for national production. It can also help inform future research, to avoid duplication of research efforts and ensure that all new research builds on existing knowledge. Investing in screening systems and identifying ways to introduce them locally can, in turn, support innovation and R&D. The NATD has already taken important steps to help Kazakh firms gain access to foreign technology. In particular, it offers a grant for technology transfer to local firms that license a patent from abroad.

The NATD is also directly involved in technology screening, with the aim of matching national technology needs with available foreign technologies. For this purpose, since 2010 it has created five small international technology transfer centres, in co-operation with foreign partners in China, France, Korea, the Russian Federation and the United States. Further efforts in this direction would be valuable.

Recommendation 19. Enhance public support to connect national firms with global technology markets in order to promote the commercialisation of national technology abroad, with special attention to Eurasian Economic Union countries.

So far, efforts to commercialise Kazakh technologies in foreign markets have not had marked impacts. In an initial phase, it would be more realistic to focus on the expansion of Kazakh technologies to neighbouring Central Asian countries, which have similar socio-economic backgrounds and face similar technological challenges. The Eurasian Economic Union and the Eurasian patent facilitate the expansion of Kazakh technologies and products into this region. Thanks to its international linkages, and the undergoing expansion of its activities, the TCC could support linkages with international technology markets.

Recommendation 20. Build on recent improvements in the national IP system as part of a broader strategy to attract R&D-related foreign direct investment.

Although inflows of R&D-related FDI remain very low, in recent years Kazakhstan has improved its relative attractiveness as a regional hub for the R&D centres of foreign multinationals. Traditionally, the Russian Federation and Ukraine have been the preferred destinations of such FDI in the region. As part of wider efforts to promote R&D-related FDI, Kazakhstan should continue to improve the quality of its IP system. It would also be advisable to engage in collective efforts with other countries involved in strengthening the value of the Eurasian patent. Concerns raised by foreign corporations relate to parallel imports and the customs protection of IP rights.

Recommendation 21. Foster the use of international franchises, especially in the food and textile sectors, by providing technical support and training.

Franchises offer learning opportunities for local firms as they facilitate the international transfer of non-technological knowledge, including modern business practices and tacit know-how. Several franchises already operate in Kazakhstan, but huge potential remains. To promote the uptake of franchises, it would be advisable to simplify the existing procedure for registering franchise contracts. While not at the frontier of innovation, providing technical support and training to foster the use of franchises could be a stepping stone for developing IP use more broadly, beyond the focus on attracting more R&D-related FDI. The food and textiles industries are best placed to benefit from the expansion of franchises, although opportunities also exist in other industries, including consumer goods, electronics and automobiles, among others.

Recommendation 22. The National Center of Science and Technology Evaluation should engage in efforts to set up an evaluation system to assess the market potential of IP assets before providing funding and/or support for their commercialisation. It should also contribute to developing, jointly with other institutions, guidelines on commercialisation to render uptake more straightforward.

Industry-based assessments of the value of IP are critical to avoid providing support to low-quality IP. The National Center of Science and Technology Evaluation, a specialised agency created in 2011 under the Ministry of Education and Science, could lead the efforts to develop new systems and guidelines for IP valuation and to support capacity building in this area by other agencies. Several guidelines that deal with the issue of IP valuation that might be of reference for Kazakhstan include those developed

in the Philippines (DOST/DTI/IPOPHL, 2012) and China (China Appraisal Society, 2015), as well as Denmark's web portal with detailed guidance for IP valuation (Danish Patent and Trademark Office, 2016). Importantly, such a system should not only be based on the IP title itself, but reflect its market value. This valuation initiative (and resulting techniques, guidelines, etc.) could also be shared and used by other agencies like the NATD, the NCSTI or the TCC. Universities, PRIs and firms should be encouraged to consider the market value of IP very early in R&D projects in order to invest resources only in those with commercialisation potential.

Notes

1. The firm sample for Eastern Europe and Central Asia comprises the following 30 countries: Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, the Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kosovo, Kyrgyzstan, Latvia, Lithuania, Macedonia, Moldova, Mongolia, Montenegro, Poland, Romania, the Russian Federation, Serbia, the Slovak Republic, Slovenia, Tajikistan, Turkey, Ukraine and Uzbekistan.
2. The EAEU is an international organisation for regional economic integration that includes Armenia, Belarus, Kazakhstan, Kyrgyzstan and the Russian Federation. It constitutes an integrated single market, providing for the free movement of goods, services, capital and people, and pursues a common transport, energy and agricultural policy.
3. The Technology Commercialization Project was approved in 2008 by the World Bank and the Ministry of Education and Science. However, due to implementation delays, its operations did not start until 2010.
4. In Kazakhstan, grants for the commercialisation of technologies have increased over time. Seven grants were supported in 2011; 10 in 2012; 19 in 2013; and 29 in 2014.
5. As a result, in Kazakhstan the use of IP by third parties is mostly by means of other agreements that do not require registration.
6. www.eua.be/activities-services/projects/current-projects/research-and-innovation/Responsible-Partnering-Initiative.aspx.

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Chapter 2.

Kazakhstan's socio-economic conditions and innovation potential

This chapter provides background for discussing the potential contribution of the intellectual property (IP) system to Kazakhstan's socio-economic development. An outline of the country's macroeconomic situation and industrial structure is followed by a brief review of the framework conditions for innovation – human capital, finance and infrastructure. An overview of the national innovation system follows, comprising a profile of its main actors and governance structures, as well as major science and innovation policy programmes.

The demands on any national intellectual property system to promote innovation and economic development depend on the specific socio-economic conditions of the country in question, and particularly on the characteristics of the innovation system in place. This chapter looks at Kazakhstan's socio-economic situation and innovation potential as a backdrop to the analysis of the intellectual property (IP) system that will be developed in the rest of this Review.

2.1. Kazakhstan's socio-economic development

Kazakhstan was the last Soviet republic to achieve independence, in December 1991. The transition to a market system and integration into the world economy brought about major institutional reforms. But the public sector continues to dominate the economy through a pronounced bureaucratic structure, while the private sector remains weak.

With a per capita gross national income (GNI) of USD 11 850 in 2014, Kazakhstan is classified by the World Bank as an upper middle-income country (World Bank, 2016d). It is second among Eurasian Economic Union (EAEU) countries in terms of GNI per capita, behind the Russian Federation (USD 13 220) but ahead of Belarus (USD 7 340), Armenia (USD 4 020) and Kyrgyzstan (USD 1 250). Kazakhstan's gross domestic product (GDP) was USD 217.9 billion in 2014, ranking it 48th in the world (World Bank, 2016e).

The exploitation of Kazakhstan's vast mineral resources, especially of oil, has spurred economic development since the country's independence. However, over-reliance on oil extraction as a lever of that development has become a growing concern in the face of uncertain demand, fluctuating prices, environmental challenges and limited job generation from mineral extraction activities. The drop in oil prices that began in June 2014 has led to a sharp cut in budget revenues and to a devaluation of the national currency (the tenge, KZT). Public programmes in various areas were suspended due to the resulting budgetary constraints.

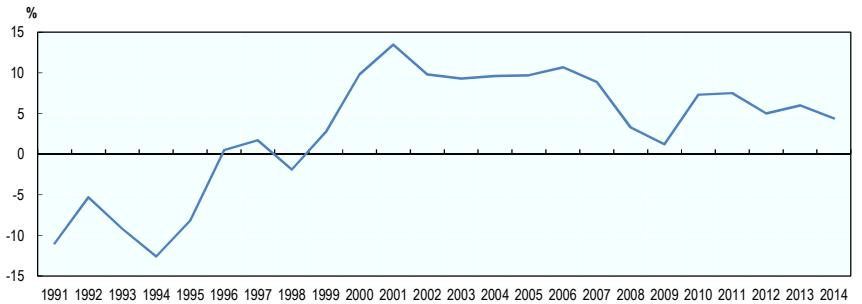
The government is trying to diversify the economy, encouraging more knowledge-intensive, value-added activities. Science, technology and innovation (STI) policies are thus becoming increasingly important in an agenda that seeks to avoid the pitfalls of this "resource curse" that, it is argued, challenges development (Razavi, 2014). In 2000, the government established the Kazakhstan National Fund to collect and manage public income generated from oil. The aim was to provide economic stability by accumulating savings for future generations, including through investments in STI.

Kazakhstan is a relatively small country in terms of population, with 17.3 million inhabitants in 2014. However, it covers the world's ninth largest

geographic area; roughly eight times the size of Germany. Kazakhstan shares borders with the People's Republic of China (hereafter "China") and the Russian Federation, two large countries in the global economy. Moreover, in 2014 Kazakhstan founded the Eurasian Economic Union (EAEU) with Belarus and the Russian Federation. The EAEU introduced the free movement of goods, services, capital and people among its members, which now include Armenia and Kyrgyzstan. It has a combined population of over 183 million.

Kazakhstan's economy grew at an average annual rate of 3% between 1991 and 2014 (Figure 2.1). The country suffered a strong economic contraction during the 1990s, following the collapse of the Union of Soviet Socialist Republics (USSR). However, during the period 2000-14, average annual GDP growth reached 7.7% – above that of OECD countries (1.7%), Europe and Central Asia (1.7%), and upper middle-income countries (5.9%). This strong growth rate was driven mainly by the exploitation of the country's natural resources at a time of rising oil prices. The Kazakh economy experienced a downturn in 2007-09 as a result of the global financial crisis, but returned to strong growth in 2010.

Figure 2.1. **GDP growth in Kazakhstan**



Source: World Bank (2016a), "GDP growth (annual %)", *World Development Indicators*, http://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG, based World Bank national accounts data.

There are major regional disparities within the country in terms of income levels and industrial structure (USAID, 2006). Kazakhstan has 14 regions (*oblasts*) and 2 "cities of republican status": the new capital of Astana and the old capital of Almaty. Oil extraction activities are concentrated in five regions located in the west of the country (Aktobe, Atyrau, Kyzylorda, Mangystau, and West Kazakhstan). These regions jointly account for 19% of the country's population and 35% of the country's area. Agriculture is most important in six regions located in the north and south of the country (Akmola, Almaty, Kostanay, North Kazakhstan, South Kazakhstan,

Zhambyl). These agricultural regions represent 34% of the country's population and 47% of its area. Agriculture represents at least 20% of GDP in each of these regions, and they jointly account for around 70% of the country's agricultural value added. Another group of three regions (East Kazakhstan, Karaganda and Pavlodar), located in the northeast and centre of the country, is characterised by relatively low agricultural production and strong industrial sectors, including coal, copper, aluminium, steel, heavy machinery, automobile assembly and electricity. These regions jointly account for 31% of the country's population and 21% of its area.

Finally, Almaty and Astana are the country's largest cities, with a population of around 1.5 million and 0.7 million respectively, and economies dominated by services. They concentrate 13% of Kazakhstan's population in an area representing less than 0.04% of the country's landmass, and enjoy the highest levels of income per capita. The three regions with the next highest GDP per capita are the mineral resource-rich regions of Atyrau, Mangystau and West Kazakhstan (Table 2.1). The three poorest regions mainly depend on agriculture and are located in the southeast of the country: South Kazakhstan, Zhambyl and Almaty.

Table 2.1. **Kazakhstan's GDP per capita by region, 2014**

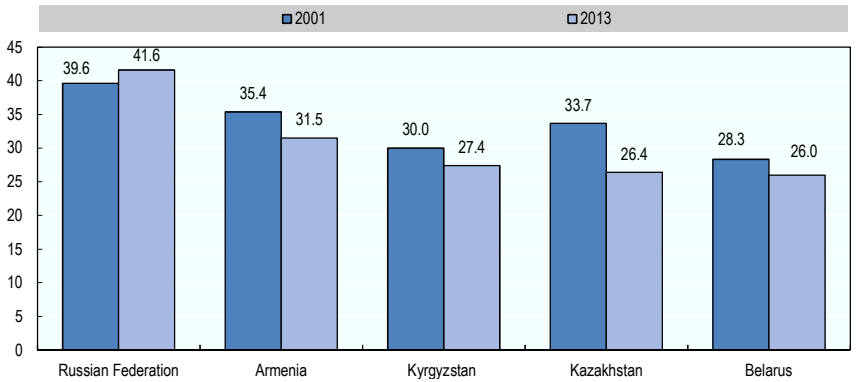
Region	USD PPP	Kazakhstani tenge (KZT)
Akmola region	15 364	1 432 000
Aktobe region	24 682	2 300 400
Almaty city	53 893	5 023 000
Almaty region	10 785	1 005 200
Astana	51 786	4 826 600
Atyrau region	74 331	6 927 900
East Kazakhstan	17 606	1 640 900
Karaganda	22 714	2 117 000
Kostanay	17 032	1 587 400
Kyzylorda region	18 947	1 765 900
Mangystau region	40 942	3 815 900
North Kazakhstan	14 921	1 390 700
Pavlodar region	24 919	2 322 500
South Kazakhstan	9 326	869 200
West Kazakhstan	32 719	3 049 500
Zhambyl region	9 654	899 800

Note: Currency conversions have been calculated using PPP conversion factors provided by the World Bank. Full details of the conversion factors used are provided in Annex A.

Source: Committee on Statistics (2015), "Kazakhstan", www.stat.gov.kz/faces/homePage?_adf.ctrl-state=12kje3livy_25&_afrLoop=6236727715689423.

Despite persisting regional disparities, Kazakhstan is one of the EAEU countries with the lowest inequalities in terms of the Gini coefficient (Figure 2.2). Inequalities in recent years have decreased, with the Gini coefficient dropping from 33.7 in 2001 to 26.4 in 2013. In addition, the share of households under the poverty threshold has significantly decreased in the past decade, from 46.7% in 2001 to 2.8% in 2014 (from 59.4% to 4.9% in rural areas) (Committee on Statistics, 2015; World Bank, 2016b). Yet in spite of these positive trends, large portions of the population in Kazakhstan remain without access to basic public services such as safe drinking water, sanitation, healthcare, education, the Internet and protection from natural disasters (World Bank, 2014a). This affects certain regions of the country in particular.

Figure 2.2. **Gini coefficients in EAEU countries**



Note: 2001 and 2013 are used since they are the first and last years for which data are available for Armenia and Kazakhstan. For other countries, data are for 2012 instead of 2013.

Source: World Bank (2016b), "GINI index (World Bank estimate)", *World Development Indicators*, http://data.worldbank.org/indicator/SI.POV.GINI, based on primary household survey data obtained from government statistical agencies and World Bank country departments. For more information and methodology, please see PovcalNet.

2.2. Industry structure

Apart from the services sector, which accounted for 55% of GDP in 2014, minerals are the largest sector in Kazakhstan's economy. Kazakhstan is among the world's top producers of oil, gas, uranium, chromite, copper, zinc and lead. Of special relevance are its oil deposits, mainly on the Caspian shelf, which constitute the 12th largest proven oil reserves in the world. The oil and gas industry make up 25% of GDP, but only 1% of employment in Kazakhstan. Mining and metallurgy industries represent an additional 9% of GDP and 5% of employment.[1]

The other backbone industry of the national economy is agriculture, which accounted for 4.7% of GDP in 2014 and 24% of employment in 2013 (World Bank, 2016f; 2016g). In the north, large-scale farms dominate, specialised in grain and oilseed production, and characterised by more capital-intensive techniques. The south, on the other hand, is characterised by small-scale farming with mixed agriculture, including most of the country's horticultural, cotton and rice production. Although the government is trying to stimulate the emergence of modern, large-scale commercial farms, a key challenge is that over two-thirds of agricultural production continues to be performed by small farms and subsistence-oriented households. The country's availability of arable land per inhabitant (1.5 hectares) is the second-highest in the world after Australia (OECD, 2013).

Given the country's vast mass of unexploited land, opportunities exist for expanding agricultural output in response to rising global demand for food products (Brown, 2014). To embrace these opportunities, greater investments in the transport infrastructure, agricultural research, and food safety systems are necessary (OECD, 2013). The local transportation network is still weak, the uptake of modern technology remains slow, and modern phytosanitary and food safety systems have yet to be fully deployed.

As for the business demographics of Kazakhstan, state-owned enterprises (SOEs) play a prominent role in the economic landscape, while the private sector remains very weak. Most SOEs are organised under the umbrella of the Samruk-Kazyna sovereign wealth fund,[2] including the state oil and gas company KazMunaiGas; the nuclear holding company Kazatomprom; the Samruk-Energy company; the national mining company Tau-Ken Samruk; the national airline Air Astana; the national railway company Kazakhstan Temir Zholy; the national telecom company Kazakhtelecom; the national postal service Kazpost; several chemical and pharmaceutical companies; and numerous financial groups.

The dominance of SOEs may, however, change in the near future. In November 2015 the government announced an ambitious privatisation plan for 2016-17 that involves selling off at least 25% of stakes in 43 large SOEs, worth a combined USD 8.1 billion (KZT 2.5 trillion), to foreign investors (The Economist Intelligence Unit, 2015). These include some of the above-mentioned large SOEs, such as KazMunaiGas, Kazatomprom, Kazakhstan Temir Zholy, Samruk-Energy, Tau-Ken Samruk and Kazakhtelecom (Kynge and Farchy, 2015). The objective of the privatisation plan is threefold: 1) to raise public revenue, as the economy faces a slowdown due to falling commodity prices; 2) to streamline Samruk-Kazyna's operations to increase its efficiency; and 3) to reduce the government's role in the economy so as to boost competition and productivity growth (The Economist Intelligence Unit, 2015).

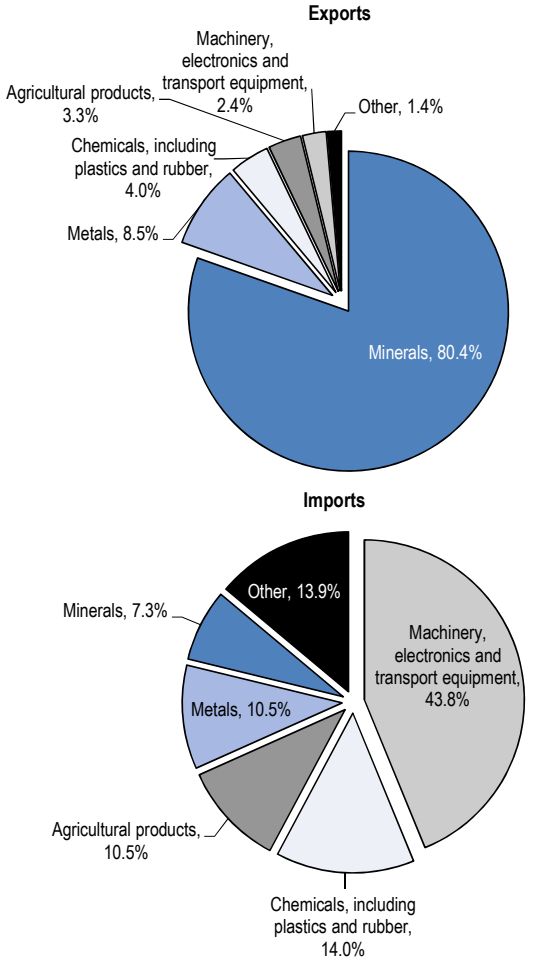
The contribution of small and medium-sized enterprises (SMEs) to the national economy is very low by international standards. In 2014, SMEs represented 26.2% of GDP and 33% of employment in the country (Committee on Statistics, 2016). Meanwhile, the contribution of informal firms to the economy in 2013 was estimated at 28.6% of GDP and about one-third of total employment (World Bank, 2014b). As is the case in many countries with a sizeable informal sector, the incidence of informality is higher in rural regions.

2.3. Trade patterns and foreign direct investment

Kazakhstan has progressively opened its economy to trade and foreign direct investment (FDI). In November 2015, the country became a member of the World Trade Organization (WTO). Kazakhstan is also member of the Commonwealth of Independent States Free Trade Area (CISFTA) and the Eurasian Economic Union (EAEU), which replaced the Eurasian Economic Community (EurAsEC). The EAEU is an international organisation for regional economic integration that includes Armenia, Belarus, Kazakhstan, Kyrgyzstan and the Russian Federation. It promotes the free movement of goods, services, capital and people, and pursues a common transport, energy and agricultural policy. As part of these regional alliances and beyond, Kazakhstan signed several treaties in the field of intellectual property protection for the purpose of guaranteeing compliance with the common principles of IP administration within the territories (see Chapter 3 for more details).

Kazakhstan's trade basket is characterised by the prevalence of mineral resources in exports (Figure 2.3). Minerals (including oil and gas) accounted for as much as 80.4% of total exports in 2014, up from 74.7% in 2010. The share of agricultural products was relatively low at 3.3% in 2014. With regard to imports, "Machinery, electronics and transport equipment" represented the largest share (43.8%) in 2014, followed by "Chemicals including plastics and rubber" (14%). The Russian Federation, China, Italy, the Netherlands and France are Kazakhstan's top trading partners, for both imports and exports. In 2014, the Russian Federation accounted for 33.3% of total imported goods in Kazakhstan, followed by the European Union (21%) and China (17.9%). In turn, the European Union is the main destination for Kazakhstan's exported goods, accounting for 57.1% of the total in 2014, followed by China (12.5%) and the Russian Federation (6.6%) (WTO, 2015).

Figure 2.3. **Structure of Kazakhstan's foreign trade, 2014**



Source: Committee on Statistics (2015), "Kazakhstan", www.stat.gov.kz/faces/homePage?_adf.ctrl-state=12kje3livy_25&_afrLoop=6236727715689423.

As for FDI, between 2010 and 2014 the average annual inflows of FDI were equivalent to 5.8% of GDP, substantially above those of the Russian Federation (2.5%), Europe and Central Asia (3.1%), OECD countries (2.1%), and upper middle-income countries (3.3%) (UNCTAD, 2015). The largest investor country in Kazakhstan was the United States, followed by France, the Netherlands, the United Kingdom and China (OECD, 2012).

By sector, the extractive industries, particularly oil and gas extraction, were the largest recipients of FDI inflows in Kazakhstan, with USD 8 480 million in 2014 out of a total FDI of USD 23 888 million (National Bank of Kazakhstan, 2015). The US oil company, Chevron, is one of the largest foreign investors in the country, and plays a prominent role in Tengiz, one of the main oil fields in the country located at the northeast shore of the Caspian Sea. As part of its economic diversification strategy, Kazakhstan is striving to attract more foreign multinationals to non-extractive sectors and to more technology-intensive activities in the automotive, pharmaceutical, civil infrastructure and renewable energy sectors. This endeavour has been challenging but some progress has been made in recent years in a few sectors (Box 2.1). Kazakhstan will host the World Expo in 2017 with the theme "Energy of the Future", and intends to use it as a platform to attract foreign investors to the renewable energy sector.

Box 2.1. **Examples of foreign direct investment in high-technology sectors in Kazakhstan**

There are numerous examples of foreign direct investment in high-technology sectors in Kazakhstan. In the pharmaceutical sector, an interesting example is the case of the Polish firm Polpharma, which operates a factory with around 900 employees in the South Kazakhstan region. As part of the national strategy to build railway infrastructures, in recent years several foreign companies operating in this sector (such as Alstom, Siemens and Talgo) have increased their presence in the country to produce electric high-speed locomotives, as well as other components and engineering works. Other foreign firms like BASF and Knauf have become progressively engaged in the production of innovative chemical additives and construction materials.

In the ICT sector, several multinationals have shown interest in collaborating further with Kazakhstan. For example, in 2009, Intel and the Fund of the First President of Kazakhstan signed a memorandum of co-operation to establish a centre for supercomputing technologies**,** with the aim of developing high-performance computing. That same year, IBM opened the Linux Center of Innovation in Astana to promote the development and adoption of open standards and open source technologies among Kazakhstan's businesses and governmental organisations.

Sources: Daly, J.C.K. (2014), "Kazakhstan looks to become Central Asia's Silicon Valley", www.silkroadreporters.com/2014/10/06/kazakhstan-looks-become-central-asias-silicon-valley; Kaznex Invest, www.kaznexinvest.kz.

To attract more FDI to support national development, generous tax deductions and grants are being offered to foreign investors in ten special economic zones (SEZs) located throughout the country.[3] Incentives include tax exemptions on land and property, a deduction of corporate income by

100%, as well as exceptions from the customs regime. To increase the spillovers of FDI to the domestic economy, the government has introduced local content requirements (i.e. the obligation to purchase intermediate goods and services from Kazakh producers), but the effectiveness of these kinds of measures is questionable (OECD, 2014a; Yusuf, 2015).

2.4. Conditions for innovation: Human capital, access to finance and infrastructure

2.4.1. Human capital

Kazakhstan lacks skilled human capital for innovation (INCO-NET, 2012; World Bank, 2013a). According to data from the UNESCO Institute of Statistics, tertiary education enrolment,[4] at 44.5% in 2011, was lower than in Belarus (92.9%), the Russian Federation (76.1%) and Kyrgyzstan (47.6%). Around 25.5% of Kazakhstan's population aged 25 years or older in 2007 attained a tertiary education level, behind other countries in the EAEU such as the Russian Federation (60%), Belarus (50.2%) and Armenia (44%). According to data from the Committee on Statistics of Kazakhstan provided by the Ministry of Justice, in 2015, there were 3.7 million people with tertiary education in Kazakhstan, i.e. approximately 21% of the population. By contrast, 71% hold a post-secondary degree or an upper-secondary degree, considerably above the rates in the Russian Federation (22%), Belarus (32%) and Armenia (46%) (UNESCO, 2015). Evidence also suggests that the quality of education is insufficient: Kazakhstan's secondary school students underperform in the Programme for International Student Assessment (PISA) compared with other countries at similar levels of development (Riboud, 2014). The results of the latest PISA available, conducted in 2012, show that 45.2% of students in Kazakhstan are low achievers in mathematics, significantly above the 24% registered in the Russian Federation and the 23% average for OECD countries. Kazakhstan's performance in mathematics is similar to that of Bulgaria, Thailand and the United Arab Emirates. Performance in reading and science is also considerably below OECD averages (OECD, 2014c).

Recent evaluations identified severe shortcomings within the education system that explain this underperformance, including low financing for education; unequal educational opportunities for students; inefficient incentives for professors; limited resources for education; and weak interaction between university and industry (OECD and The World Bank, 2007; OECD, 2014b). Government expenditure in education was 3.1% in 2011 – a very low figure by international standards and lower than in neighbouring countries like the Russian Federation (4.1%), Belarus (5.12%) or Kyrgyzstan (6.79%) (UNESCO, 2015). According to data from the Committee on Statistics of Kazakhstan

provided by the Ministry of Justice, in 2015, public expenditure on education amounted to KZT 1 364 billion (approximately USD 14.64 billion).

The Kazakhstan 2050 Strategy, launched by the government in 2012, sets out key objectives and targets for 2012-50 and emphasises the importance of raising the quality of human capital. This emphasis is also reflected in programmes such as the State Program of Development of Education of the Republic of Kazakhstan for 2011-2020, approved in 2010. Another major initiative is the Strategic Plan of the Ministry of Education and Science, launched in 2014, which aims to bring innovation and best practices to every stage of the educational system. Moreover, Kazakhstan has joined the EU Bologna Process for harmonising university education, adopting new regulations for bachelor, master and doctoral degrees. This can contribute to enhancing the quality of higher education.

2.4.2. Access to finance

Lack of finance is another major obstacle to innovation in Kazakhstan (World Bank, 2014a). The country still lacks a sound financial system, and the recent global financial crisis exposed vulnerabilities in the banking sector. To prevent the collapse of the banking system, the government nationalised three of the country's largest banks, but the large stock of non-performing loans that emerged during the crisis remains an unresolved issue (IMF, 2014).

Against this background, the risk aversion of banks has increased, and banks tend to grant credit solely to companies with a good track record that can provide sufficient collateral. As a result, SMEs, entrepreneurs and innovative ventures face increasing difficulties in accessing bank loans. To address this, the government introduced an economic reactivation programme in 2014, partly aimed at providing subsidised loans to SMEs. Under the programme, banks receive funds from the government at subsidised rates that are then loaned to SMEs at below-market interest rates (IMF, 2014). However, as banks still bear responsibility for the credit risk, they continue to focus on established companies with sufficient collateral.

In addition, the venture capital sector in Kazakhstan is still at a very early stage of development, and depends largely on the support of the state (Cengel, Alpay and Sultangazin, 2013). To further its development, in recent years the National Agency for Technological Development (NATD) has helped create, and is currently a partner in, several domestic and international venture funds earmarked for investment in innovative production. However, the lack of suitable opportunities and the resulting tendency to use venture funds to finance expansion of the productive capacity of existing companies rather than financing innovative start-ups has failed to create funding opportunities for innovators (World Bank, 2014b).

The challenges to financing innovation are made even tougher by the volatility of public funding available for innovation, since that availability depends on mineral resource sales and is consequently affected by trends in global demand.

2.4.3. Infrastructure

There are significant barriers to modernising Kazakhstan's industry, including the great distances between cities, low population densities in many parts of the country and large rural areas with poor infrastructure. Despite recent investments, the local road infrastructure in many regions remains precarious, and the railroad system is slow and obsolete. Such infrastructure constraints also affect the country's conditions for exports, all the more so since the country is landlocked. To accelerate improvement of the situation, the government approved a new law on public-private partnerships in October 2015. Since 2013, the Chinese government has been planning and supporting what is called the "New Silk Road" project, aimed at better linking China with Europe through Central Asia – including Kazakhstan – and the Middle East. Developing new infrastructure (including roads and railways) in tandem with the project's development could represent an opportunity for Kazakhstan to increase trade with a range of countries.

The ICT infrastructure of Kazakhstan has improved over the past decade. Fixed broadband penetration reached 12.9% of inhabitants in 2014, a marked increase from 3.7% in 2009 and 0.02% in 2005 (ITU, 2015). According to the World Economic Forum's *Global Competitiveness Report 2015-2016* (World Economic Forum, 2015), Kazakhstan ranked 58 out of 139 countries in terms of fixed broadband Internet subscriptions per 100 population, similar to China (ranked 57) and Chile (56); below the Russian Federation (48) and Romania (46); and above Turkey (61) and Ukraine (72). In terms of mobile broadband subscriptions per 100 population, Kazakhstan ranked 44th, below the Russian Federation (37) but well above Ukraine (121) (ITU, 2015). According to an ITU estimate, 55% of the Kazakh population used the Internet in 2014.

Based on the 2013 World Bank Enterprise Survey of 600 firms, 47.7% of firms in Kazakhstan have their own website, below the 61.6% average of 30 countries in Eastern Europe and Central Asia (ECA)[5] (World Bank, 2013b). Overall, Kazakhstan's ICT infrastructure still falls short of advanced country levels; additional improvements are necessary to support the emergence of a modern knowledge-based economy (Linn, 2014).

The institutional framework for business and innovation also needs improving; the chief problems are weak competition and regulatory frameworks, cumbersome red tape, and lack of trust. In recent years,

Kazakhstan has made substantial progress in removing bureaucratic barriers to business. In the 2010 edition of the World Bank's *Doing Business* report, Kazakhstan ranked 63rd out of 183 countries, while in 2016 it climbed to 41st out of 189 economies (World Bank, 2015). However, the country's rank remains very poor in some subcomponents, such as "trading across borders" (122), "dealing with construction permits" (92), "getting electricity" (71) and "getting credit" (70). Moreover, corruption remains a major issue for business. According to Transparency International's Corruption Perceptions Index (CPI), Kazakhstan ranked 126th out of 175 countries in 2014 (Transparency International, 2014).

2.5. The national innovation system

2.5.1. R&D investment and personnel

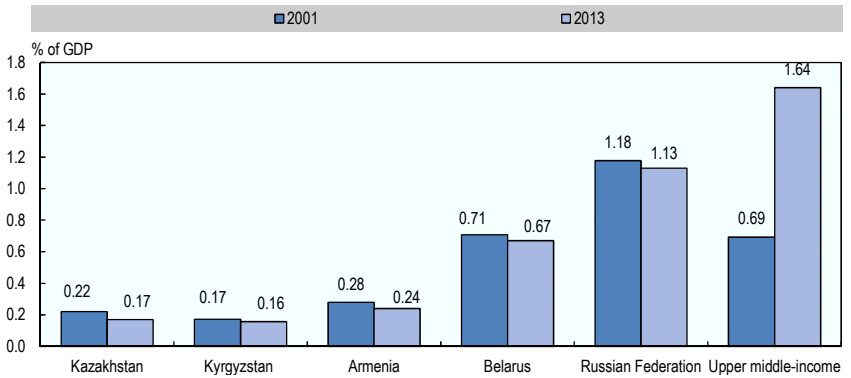
Gross expenditure on research and development (GERD) in Kazakhstan is very low by international standards. GERD as a percentage of GDP was 0.17% in 2013, well below the average of OECD countries (2.5%), upper middle-income countries (1.64% of GDP) and most other EAEU countries (Figure 2.4). This indicator actually declined in Kazakhstan between 2001 and 2013 (World Bank, 2016c). In 2013, GERD expenditure per capita (in PPP terms) amounted to USD 35 in Kazakhstan, well below the USD 174 per capita invested in the Russian Federation and the USD 895 per capita average investment in OECD countries.[6]

The State Program for the Development of Innovation and Promotion of Technological Modernization of Kazakhstan targeted an increase in R&D investment for 2010-14. However, the latest data available from national sources indicate that in 2014 the country's R&D intensity remained at just 0.19% of GDP (Committee on Statistics, 2015).

Regarding the sources of R&D investment by sector of performance, in 2014 the public research sector contributed 52% (public research institutes represented 31% and universities 21%), and the business sector (including state-owned companies) contributed 40%; the non-profit sector accounted for the remaining 8% (Committee on Statistics, 2015). Geographically, R&D investment is skewed, as the more developed city of Astana and the regions of Almaty and Mangystau accounted for over 70% of the total R&D budget in 2014 (Committee on Statistics, 2015).

Figure 2.4. **Gross expenditure on R&D in Kazakhstan and selected countries**

As a percentage of GDP



Notes: 2011 for Kyrgyzstan. Upper middle-income includes 53 countries: Albania, Algeria, American Samoa, Angola, Azerbaijan, Belarus, Belize, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, the People's Republic of China, Colombia, Costa Rica, Cuba, Dominica, the Dominican Republic, Ecuador, Fiji, Gabon, Grenada, the Islamic Republic of Iran, Iraq, Jamaica, Jordan, Kazakhstan, Lebanon, Libya, Macedonia, Malaysia, the Maldives, the Marshall Islands, Mauritius, Mexico, Mongolia, Montenegro, Namibia, Palau, Panama, Paraguay, Peru, Romania, Serbia, South Africa, St. Lucia, St. Vincent and the Grenadines, Suriname, Thailand, Tonga, Tunisia, Turkey, Turkmenistan, and Tuvalu.

Source: World Bank (2016c), "Research and development expenditure (% of GDP)", *World Development Indicators*, http://data.worldbank.org/indicator/GB.XPD.RSDV.GD.ZS, based on data from the United Nations Educational, Scientific and Cultural Organization (UNESCO) Institute for Statistics.

With regard to research personnel, in 2014 the headcount for R&D was equal to 25 793; this figure includes researchers (18 930, 43% of whom have PhDs or equivalent degrees) as well as technicians and support staff (Committee on Statistics, 2015). There were 28 researchers per 10 000 participants in the labour force in 2014 (OECD, 2015). The share of researchers is comparable to that of Argentina, Chile, China, Romania and South Africa, but lower than that of the Russian Federation and most OECD countries (Figure 2.5).

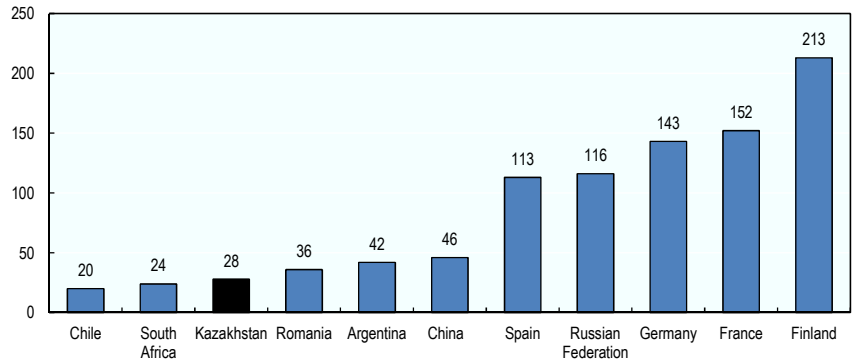
2.5.2. Performance of universities and research institutes

Public research institutes and universities account for more than half of national R&D expenditure in Kazakhstan. The Soviet system contributed to the development of a strong science base in certain areas, such as nuclear and space sciences. But by the time of independence, the country's public research system did not match industrial needs, as it suffered from

insufficient resources, lack of international connections, and an inefficient evaluation system that failed to reward excellence.

Figure 2.5. **Number of researchers in Kazakhstan and selected countries, 2014**

Per 10 000 labour force



Source: OECD (2015), *Main Science and Technology Indicators*, http://dx.doi.org/10.1787/strd-data-en.

Some of the most prominent public research institutes in Kazakhstan include the Institute of Nuclear Physics, the National Nuclear Center of the Republic of Kazakhstan, the Bekturov Institute for Chemical Sciences, the Fesenkov Astrophysical Institute, the Institute for Mathematics, the Sokolsky Institute of Organic Catalysis and Electrochemistry, the Kazakh Research Institute of Oncology and Radiology, the Almaty Institute for Power Engineering and Telecommunications, the Physics and Technology Institute, the Research Institute for Biological Safety Problems, the Eastern Mining and Metallurgical Research Institute for Non-Ferrous Metals, the National Center of Complex Processing of Mineral Raw Materials, and the Institute for Zoology.

As of 2015/16, there are 127 universities in the country, around half of which are private and were created after 1993. Most institutions focus almost exclusively on teaching, rather than research, and are often of poor quality (OECD, forthcoming b; Riboud, 2014). In the 2015/16 edition of the *QS World University Rankings*,[7] nine universities from Kazakhstan were listed (Table 2.2). However, there are no universities from Kazakhstan listed in the Academic Ranking of World Universities (ARWU) or the Times Higher Education ranking, as even the country's best institutions are behind the world's leading institutions.

Table 2.2. **Kazakh universities in the QS World University Rankings**

Name of institution	World rank	Number of students	Number of faculty staff
Al-Farabi Kazakh National University	275	17 090	3 339
L.N. Gumilyov Eurasian National University	371	14 941	3 605
Satbayev Kazakh National Technical University	551-600	11 325	2 084
Abay Kazakh National Pedagogical University	601-650	7 060	1 169
E.A. Buketov Karaganda State University	701+	6 902	787
Kazakh Ablaikhan University of International Relations and World Languages	701+	5 190	471
Kazakh-British Technical University	701+	2 187	145
Auezov South Kazakhstan State University	701+	14 308	1 524
S.Seifullin Kazakh Agro Technical University	701+	11 559	882

Note: In December 2015, the President of Kazakhstan announced the merger of the Kazakh-British Technical University with the Kazakh National Research Technical University after K.I.Satpayev.

Source: *QS World University Rankings*, 2015/16 edition, www.topuniversities.com.

Research activities are highly concentrated in a few public universities. The largest and best ranked of these universities is Al-Farabi Kazakh National University. Located in Almaty, it is also the oldest university in the country, dating back to the 1930s. The second best ranked is L.N. Gumilyov Eurasian National University, founded in 1996 in Astana with the objective of building an international university recognised as a leading research and education centre of the Eurasian region. More recently, the government created Nazarbayev University in 2010, located in Astana with the aim of developing a world-class research university (Box 2.2).

Several other universities are recognised for their teaching and research capacities in specific industries. Satbayev Kazakh National Technical University plays a prominent role in the training of engineers for the mining, metallurgical, geological and construction industries. The S. Seifullin Kazakh Agro Technical University leads research in the field of agriculture.

In terms of scientific publications, the performance of Kazakh universities and public research institutes is relatively weak. In the Scopus ranking of countries by number of scientific publications, Kazakhstan held the 86th position in 1999, moving up to the 71st in 2013 – a higher ranking than Belarus (73rd) but well below the Russian Federation (15th). With regard to the type of research conducted, according to the Scopus database, in 2013 physics was the subject of 13.2% of all Kazakhstan's publications, followed by biochemistry (12.2%), engineering (11.5%), materials (8.1%), chemistry (7.4%), mathematics (7.3%) and economics (5.7%). Table 2.3 shows a ranking of the top institutions by number of publications in 2014. The ranking is

dominated by Al-Farabi Kazakh National University and L.N. Gumilyov Eurasian National University, the country's leading public research institutions.

Box 2.2. **Nazarbayev University**

Nazarbayev University (NU), located in Astana, was created by Kazakhstan's President Nazarbayev in 2010. It was granted the status of "autonomous educational institution", and thereby the freedom to create its own governing structures and curricula. The administrative authorities of the university are the executive council; the board of trustees, comprised of government officers (50%) and representatives of NU's international partners (50%); and the supreme board of trustees, which is headed by the President of Kazakhstan.

With an initial investment of USD 2 billion, the objective was to create an institution that would train the next generation of the country's leaders, build the country's research capacities and lead the much needed reform of Kazakhstan's higher educational system. To achieve these objectives, a strong focus was placed on following international best practices and building linkages with foreign universities – including the University of Cambridge, the Argonne National Laboratory operated by the University of Chicago, the University of California, Berkeley, University College London and the National University of Singapore. Each of the departments has been developed in partnership with these institutions.

University-industry linkages are also promoted. In this regard, a new science park, the Astana Business Campus, located within the premises of the university, began operating in 2015. Further details are provided in Box 5.4 in Chapter 5.

Sources: Interview with representatives of Nazarbayev University; http://nu.edu.kz.

Over the past decades the university and public research system has undergone important reforms to improve human capital and research quality. The 2012 S&T Policy Mix Peer Review for Kazakhstan by the INCO-NET group of the European Union Framework Programme concluded that "the universities have up-to-date equipment and are implementing appropriate measures (e.g. the remodelling of curricula towards the Bologna structure, the Bolashak programme,[8] joint study programmes with universities abroad, commercialisation offices, incubators, bilateral research centres with foreign partners)". Moreover, in recent years the government has begun to develop a more selective, performance-based funding system for public universities. In 2014, ten universities were given the special status of National Research Universities with a view to giving them increasing funding and autonomy. But the process of expanding university autonomy is still under way, and even these institutions are much less autonomous than in many European countries (OECD, forthcoming b). With the exception of Nazarbayev University, universities are not fully independent regarding curriculum design and admissions, or the commercialisation of their research results.

Table 2.3. **Top 15 Kazakh institutions by number of publications in the Web of Science Core Collection, 2014**

Rank	Name of institution	Number of publications
1	Al-Farabi Kazakh National University	246
2	L.N. Gumilyov Eurasian National University	150
3	Institute of Nuclear Physics and National Nuclear Center of Kazakhstan	50
4	Satbayev Kazakh National Technical University	29
5	E.A. Buketov Karaganda State University	26
6	Kazakh-British Technical University	25
7	S.D. Asfendiyarov Kazakh National Medical University	20
8	Bekturov Institute for Chemical Sciences	11
9	Semey State Medical University	9
10	Fesenkov Astrophysical Institute	8
11	Institute of Mathematics	7
12	Sokolsky Institute of Organic Catalysis and Electrochemistry	6
12	Almaty Institute of Power Engineering and Telecommunications	6
13	Kazakh Research Institute of Oncology and Radiology	5
14	Physics and Technology Institute	2

Source: Information provided to the OECD by the National Center for S&T Information.

The forthcoming *OECD Reviews of National Policies for Education: Higher Education in Kazakhstan* (OECD, forthcoming b) highlights the fact that the spreading of scarce funding across a very large number of small research projects poses a threat to achieving excellence and building critical mass of talented faculty. The frequent change in criteria for competitive funding awards is not helpful for institutions wishing to engage in efforts to improve their performance and the timescales of funding are too short to effectively enable research.

2.5.3. Business innovation

The lack of dynamism and low propensity to invest in innovation on the part of Kazakh firms constitutes the main weakness of the national innovation system. Only a small number of firms in Kazakhstan are active in R&D and innovation, a legacy of the Soviet era, during which R&D was separated from industrial production. The *OECD Reviews of Innovation Policy: Russian Federation* concluded that the main priority should be to shift the national innovation system's "centre of gravity" away from the publicly owned R&D system and towards production firms (OECD, 2011). The same prescription is valid for Kazakhstan.

The largest share of business R&D activities is conducted by state-owned enterprises (SOEs) rather than by private firms. However, SOEs have mostly

based their technological strategies on importing ready-to-use equipment and technologies instead of in-house R&D activities and contracts with local research centres. Moreover, foreign multinationals are concentrated in the extractive industries, and tend to bring over all their technologies from abroad rather than conducting R&D locally (Yusuf, 2015). Meanwhile, most SMEs are concentrated in retail services or agriculture, and hardly invest in R&D and innovation activities (World Bank, 2014a).

The statistical evidence documents these weaknesses with respect to R&D and innovation investments: the World Bank Enterprise Survey reveals that Kazakh private firms are less innovative than the average Eastern European and Central Asian (ECA) firms: only 2.5% of the firms surveyed invested in R&D, against an average of 10.6% for ECA countries in 2013. Product innovation, process innovation, organisational innovations (including the acquisition of quality certificates) and other indicators of human capital development (such as formal training programmes provided to employees) are also significantly lower than the average for ECA countries (Table 2.4).

The innovation performance of small firms, defined as entities that employ fewer than 20 employees, was especially weak. Only 1% of all small firms declared investing in R&D, against an average of 8.4% for ECA countries. With regard to product innovation, 15.9% of small firms declared having introduced new or significantly improved products or services in the past three years, while the average for ECA countries was 22.3%. Likewise, just 8.1% of small firms from Kazakhstan had introduced new or significantly improved methods for the production or supply of products or services in the past three years, compared to 17.2% in ECA countries.

New policies have been implemented to support SMEs and entrepreneurship through the development of incubators, science parks, and different kinds of incentives and support programmes. To promote innovation in SOEs, in 2011 a new law established that the Samruk-Kazyna sovereign wealth fund, which controls most SOEs, should invest 10% of its net profit in R&D and innovation activities. The government has also established that firms active in the subsoil sector must invest 1% of their total revenue in R&D infrastructures and activities. Since the oil, gas and mineral sector is dominated by foreign firms, this measure is expected to compel foreign companies to invest in R&D locally, possibly in collaboration with local universities and research institutes. The amount of obligatory investment in R&D in Kazakhstan is specified in the contract on subsoil use between a firm and the state, and firms must submit reports on the implementation of commitments. For business innovation to flourish, it is also imperative to implement broader measures to improve the general business climate (Veugelers and Schweiger, 2015).

Table 2.4. **Innovation indicators by firm size, Kazakhstan and Eastern European and Central Asian (ECA) countries, 2013**

Percentage of firms

		Small firms	Medium firms	Large firms	Total
Firms that have invested in R&D activities, either in-house or contracted with other companies, in the past three years	Kazakhstan	1.0%	3.7%	5.6%	2.5%
	ECA	8.4%	11.1%	18.8%	10.6%
Firms that have introduced new or significantly improved products or services in the past three years	Kazakhstan	15.9%	21.1%	27.4%	19.2%
	ECA	22.3%	24.4%	31.8%	24.2%
Firms that have introduced any new or significantly improved methods for the production or supply of products or services in the past three years	Kazakhstan	8.1%	16.5%	26.0%	13.3%
	ECA	17.2%	20.9%	27.4%	19.7%
Firms that have introduced any new or significantly improved organisational or management practices or structures in the past three years	Kazakhstan	10.7%	18.3%	27.4%	15.5%
	ECA	18.3%	22.3%	30.9%	21.2%
Firms holding internationally recognised quality certification	Kazakhstan	11.2%	20.8%	41.4%	18.3%
	ECA	16.4%	24.5%	46.6%	29.3%
Firms that have their own website	Kazakhstan	38.2%	54.6%	67.1%	47.7%
	ECA	54.1%	66.2%	81.1%	61.6%
Firms that have given employees some time to develop or try out a new approach or new idea about products or services, business processes, firm management, or marketing during the past three years	Kazakhstan	15.0%	21.0%	27.4%	18.7%
	ECA	29.0%	34.2%	42.7%	33.3%
Firms that have formal training programmes for their employees	Kazakhstan	24.6%	39.2%	51.4%	33.2%
	ECA	31.0%	41.4%	57.4%	37.8%

Notes: Statistics are based on 15 862 firm observations for ECA countries and 600 for Kazakhstan. Small firms are defined as those with less than 20 employees (8 347 observations for the ECA; 309 for Kazakhstan); medium-sized firms are those with 20-99 employees (5 631 for the ECA; 218 for Kazakhstan); and large firms are those with 100 or more employees (1 884 for the ECA; 73 for Kazakhstan). The sample for the ECA comprises the following 30 countries: Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, the Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kosovo, Kyrgyzstan, Latvia, Lithuania, Macedonia, Moldova, Mongolia, Montenegro, Poland, Romania, the Russian Federation, Serbia, the Slovak Republic, Slovenia, Tajikistan, Turkey, Ukraine and Uzbekistan. "Don't know" replies are excluded from calculations and represented less than 2.2% of the sample for each question. Further information is available at: www.enterprisesurveys.org/data/exploreeconomies/2013/kazakhstan#innovation-and-technology--size.

Source: World Bank (2013b), "World Bank Enterprise Surveys: Kazakhstan country profile 2013", www.enterprisesurveys.org/data/exploreeconomies/2013/kazakhstan.

2.5.4. Linkages and knowledge flows

Linkages and knowledge flows among the different actors of Kazakhstan's innovation system are weak, particularly between science and industry (Cengel, Alpay and Sultangazin, 2013; INCO-NET, 2012; UNECE, 2012). While universities and public research institutions have looked into the commercialisation of

intellectual property based on patents, licenses and spin-off companies, little attention has been paid to other types of knowledge exchange and dissemination, including through the personal engagement of researchers with industry (OECD, forthcoming b). The weak innovative performance of Kazakhstan's business sector and its low demand for new knowledge are a major bottleneck for university-industry collaboration in innovation. Meanwhile, universities and public research institutes are also failing to produce the kind of research results that may be of interest to local industries. The interactions among the different actors in the system are often very rigid and hierarchical, challenging knowledge exchange and collaboration for innovation.

Collaboration in innovation among subsidiaries of multinational companies and local firms is also practically non-existent, because FDI is mostly concentrated in the extractive industries and Kazakhstan lacks sufficiently strong local supporting industries. In other industries, such as car manufacturing, linkages established with local firms have focused on low value-added inputs, leading to limited knowledge exchange.

2.6. Policy and governance of science, technology and innovation

2.6.1. Strategic frameworks

Innovation plays a critical role in Kazakhstan's national strategy. Most recently, in 2012, the government launched the Kazakhstan 2050 Strategy with the ambitious objective of positioning the country within the top 30 developed countries by 2050. A key element of this strategy is to build a diversified, knowledge-based economy by improving the business environment, promoting competition in all economic activities, and developing world-class research universities and smart cities (Aitzhanova et al., 2014).

Several large-scale, multi-year innovation strategies have been introduced to develop a diversified innovation economy, starting in 2003 with the Strategy of Industrial-Innovative Development (Cengel, Alpay and Sultangazin, 2013). Subsequent plans have included the State Program of Accelerated Industrial and Innovative Development for 2010-2014; the Program for the Development of Innovation and Promotion of Technological Modernization for 2010-2014; the State Program on Industrial-Innovative Development of Kazakhstan for 2015-2019; the Inter-sectoral Plan for Scientific-Technological Development until 2020; the State Program of Education Development for 2011-2020; the Productivity Program 2020; the Business Roadmap 2020; and the Nurly Zhol Program (for infrastructure development) 2015-2019. The state has commissioned a number of international organisations to carry out evaluations of the national innovation system (see, for example, Cengel, Alpay and Sultangazin, 2013; INCO-NET, 2012; UNECE, 2012).

These strategic plans have: 1) resulted in laws defining the functions of the different ministries and state agencies involved in the promotion of science and innovation; 2) established the different grants and support measures to be provided by the state; and 3) clarified the key performance measures and specific targets to be reached with respect to science and technology indicators. Ten priority sectors for support have also been identified: energy, chemicals, machinery, pharmaceuticals, construction materials, agribusiness, ICT, biotechnology, nuclear power and engineering industries.

2.6.2. Policy actors

Table 2.5 provides an overview of the main actors involved in the design and implementation of STI policy in Kazakhstan, as defined by the Law on Science of 2011. This law established the Higher Science and Technology Committee, chaired by the Prime Minister, as a co-ordination body bringing together representatives from all ministries. The law created three research funds, for basic infrastructure, research grants and research programmes, respectively, managed by the new National Centre of Science and Technology Evaluation. The selection of projects for funding is based on a competitive bidding process; decisions are taken by peer review conducted by newly established research councils that are made up of Kazakh and foreign experts. The two ministries mainly in charge of STI policy are the Ministry of Education and Science and the Ministry of Investment and Development. The Ministry of National Economy has been in charge of negotiations involving Kazakhstan's accession to the World Trade Organization, and was consequently involved in discussions concerning the country's adherence to international IP regulations set down in the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS). Other sectoral ministries such as the Ministry of Agriculture, the Ministry of Energy, the Ministry of Defence, and the Ministry of Healthcare and Social Development, also shape STI policies in their respective areas. In addition, the Ministry of Justice oversees the activities of the National Institute of Intellectual Property (NIIP) and is responsible for aspects of the court system relating to IP enforcement (see Chapter 3).

The National Agency for Technological Developments (NATD) under the Ministry of Investment and Development is the main national institution in charge of overseeing technological development. The NATD provides grants for business innovation projects, develops innovation infrastructure, carries out technological foresight, and promotes international technology transfer and investment in innovative projects through domestic and international venture capital funds. As regards specific grant programmes, until 2015, the NATD offered nine types of grants (Table 2.6). As of 2016, following the entry into force of a new Code of Commerce, these were

aggregated into three strands: a technology commercialisation grant, a grant for the technological advancement of enterprises and a grant for the technological advancement of industries (Table 2.7).

Several national holdings group together the country's main public research institutes and state-owned companies. Many of the research institutes under the Ministry of Education and Science have so far been organised under the National Scientific and Technological Holding PARASAT.[9] In addition, the main public research institutes specialised in agriculture have been organised under the umbrella of another national holding, called KazAgroInnovation. Apart from the Samruk-Kazyna sovereign wealth fund mentioned above, which groups together Kazakhstan's major state-owned companies, other relevant associations representing the business sector are the National Chamber of Entrepreneurs (Atameken) and the Association of Mining and Metallurgical Enterprises.

Recent international evaluations have drawn attention to the fragmentation of the different actors involved in STI policy (Cengel, Alpay and Sultangazin, 2013; INCO-NET, 2012; UNECE, 2012; World Bank, 2014a). The division of competencies in STI policy between the Ministry of Education and Science (which focuses on R&D by public universities and research institutes) and the Ministry of Investment and Development (which focuses on innovation by firms) has led to a dual state support structure for STI that is not well co-ordinated (Cengel, Alpay and Sultangazin, 2013; Ibraev, 2015). Some of the resulting challenges also affect the governance of the IP system, as discussed in Chapters 3 and 5.

Table 2.5. **Key actors of the Kazakh STI policy system and their main roles**

Key actors	Main roles
Ministries	
Ministry of Education and Science	– Defines policies and policy programmes in the fields of education and public investment in scientific research. – Provides funding for basic and applied research; launches regular calls for grants targeted at individual researchers and research groups. – Monitors performance, funding and accreditation of universities and public research institutes.
Ministry of Investment and Development	– Defines policies and policy programmes in the fields of business innovation, private sector development, cluster development and investment attraction. – Provides funding to promote entrepreneurship and innovation.
Ministry of Justice	– Defines policies with regards to intellectual property rights. – Establishes the intellectual property rights regime and is responsible for aspects of the court system relating to the enforcement of intellectual property rights.
Ministry of National Economy	– Led the negotiations regarding Kazakhstan's accession to the World Trade Organization, and the country's adherence to the Agreement on Trade-Related Aspects of Intellectual Property Rights.

Table 2.5. Key actors of the Kazakh STI policy system and their main roles (*continued*)

Key actors	Main roles
Advisory bodies	
Higher Science and Technology Committee – Created in 2011 – Chaired by the Prime Minister; brings together representatives from all ministries	– Co-ordination and advisory body. – Co-ordinates R&D activities in Kazakhstan in close co-operation with the Ministry for Investment and Development and the Ministry of Education and Science. – Oversight and selection of priorities for public research funding.
National Academy of Sciences	– Association of scientists that provides advice to the government on scientific matters and publishes an annual report on the state of science and developing trends within the country and globally, as well as recommendations on how to improve the scientific potential of the country.
Government agencies/intermediate organisations	
National Agency for Technological Development (NATD) – Created in 2003 – Reports to Ministry of Investment and Development	– Invests in innovative industrial projects by participating in equity capital, creating new entities with foreign participation and participating in investment funds. – Takes part in creating, managing and co-ordinating technology commercialisation offices, technoparks and design offices. – Co-operates with international organisations with the aim of attracting information, educational and financial resources to stimulate technological development in strategic economic industries. – Takes part in state support measures concerning technological business incubators, commercialisation of technologies and technology transfer, enhancement of personnel, managerial and industrial potential of innovative industries. – Provides grants to support innovative industries. – Supports venture funds. Takes part in technology forecasting.
National Institute of Intellectual Property (NIIP) – Created in 2003 – Reports to Ministry of Justice	– National intellectual property office. – Manages the intellectual property examination and registration procedures and conducts awareness campaigns (see Chapter 3).
Technology Commercialization Center (TCC) – Created in 2013 as part of the World Bank Technology Commercialisation Project (2010-15) – Reports to Ministry of Education and Science	– Provides grants, training and support for technology commercialisation (see Chapters 5 and 6).
National Center of Science and Technology Evaluation (NCSTE) – Created in 2011 – Reports to Ministry of Education and Science	– Organises evaluation and monitoring of publicly funded research projects and programmes. – Ensures fairness and transparency in the selection of research projects that receive public funding. – Co-ordinates the national research councils, formed by leading researchers across different scientific fields, that identify strategic technology fields for targeted support and recommend projects for funding.

Table 2.5. Key actors of the Kazakh STI policy system and their main roles (*continued*)

Key actors	Main roles
National Center for Scientific and Technical Information (NCSTI) – Created in 1957 – Reports to Ministry of Education and Science	– Collects information on the country's scientific production, and creates open databases and search tools to map Kazakhstan's research outputs (including PhD theses, scientific publications and patents). – Organises seminars and workshops with foreign scientists, and provides researchers with training on how to apply for international grants and how to write in international journals. – Promotes university-industry links and the commercialisation of research results, mainly through sharing information and organising networking events and conferences.
National holding companies	
Parasat – Created in 2008 – Board of directors chaired by the Vice-Minister of Education and Science	– Groups together some of the main public research institutes across different scientific disciplines. – Manages the Science Fund, which provides grants and loans to research teams, organisations and companies involved in early-stage research and development activities with commercialisation potential.
KazAgroInnovation – Created in 2007 – Board of directors chaired by the Vice-Minister of Agriculture	– Groups together more than 40 organisations (including 25 scientific institutes, 15 testing farms, a centre of technology commercialisation and a centre of technology extension) in the area of agriculture. – Operates a network of regional centres to strengthen technology diffusion across regions. – Promotes the commercialisation of technologies developed in the relevant research institutes, collaborating with foreign partners to develop, manufacture and provide the market with competitive products based on domestic and foreign licences.
Baiterek – Created in 2013 – Board of directors chaired by the Prime Minister	– Provides financial support to non-extractive industries to drive economic diversification. – Comprises 11 subsidiaries including the Development Bank of Kazakhstan, the Investment Fund of Kazakhstan and the Damu Entrepreneurship Development Fund (main government initiative to support small and medium-sized enterprises under the State Program of Accelerated Industrial and Innovative Development 2010-14).
Zerde – Created in 2008 – Under the Ministry of Investment and Development	– Promotes the creation of favourable conditions to improve the competitiveness and economic efficiency of the ICT sector, including the development of the ICT infrastructure and ICT standards. – Promotes investments and innovations in ICT and supports e-government activities.
Samruk-Kazyna – Created in 2008 – Board of directors chaired by the Prime Minister	– Groups together the main state-owned companies across different industries, and thus has a major influence over state-owned enterprises' R&D activities.

Source: Based on interviews conducted with representatives of the above-mentioned institutions as part of the consultation process for this project.

Table 2.6. **Types of innovation grants offered by the National Agency for Technological Development to firms in Kazakhstan, until 2015**

	Grant type	Category of use	Maximum amount	Maximum period (months)
1	Professional development of technical engineering personnel	Travel, accommodation, organisation services	USD 22 000 (KZT 2 million)	3
2	Consultation of foreign specialists	Services of specialists, at most three per year	USD 97 000 (KZT 9 million)	12
3	Advisory and engineering services	Consulting	USD 54 000 (KZT 5 million)	6
		Engineering	USD 322 000 (KZT 30 million)	18
4	Implementation of management and production technologies	Implementation arrangements	USD 161 000 (KZT 15 million)	12
5	Industrial research	Remuneration of labour, equipment, etc.	USD 322 000 (KZT 30 million)	20
6	Support of high-technology production (start-ups)	Equipment, industrial premises, etc.	USD 537 000 (KZT 50 million)	36
7	Patenting abroad	Filing of a patent application, registration and patent support	USD 67 000 (KZT 6.25 million)	36
8	Acquisition of technologies	Licences/patents	USD 1.69 million (KZT 150 million)	36
9	Commercialisation of technologies	Conception and industrial prototype	USD 322 000 (KZT 30 million)	30

Note: Currency conversions have been calculated using PPP conversion factors provided by the World Bank. Full details of the conversion factors used are provided in Annex A.

Source: Adapted from NATD (2015), *Innovation System of the Republic of Kazakhstan*.

Table 2.7. **Types of innovation grants offered by the National Agency for Technological Development to firms in Kazakhstan, since 2016**

	Grant type	Category of use	Maximum amount	Maximum period (months)
1	Technology commercialisation grant	Innovators	USD 2.2 million (KZT 200 million) (co-financing up to 80%)	36
2	Grant for technological advancement of enterprises	Enterprises	USD 4.3 million (KZT 400 million) (co-financing up to 50%)	36
3	Grant for technological advancement of industries	Consortia (enterprises +universities/public research institutions)	USD 8.6 million (KZT 800 million) (co-financing up to 80%)	36

Note: Currency conversions have been calculated using PPP conversion factors provided by the World Bank. Full details of the conversion factors used are provided in Annex A.

Source: Entrepreneurial Code of the Republic of Kazakhstan No. 375-V of October 29, 2015, http://adilet.zan.kz/K1500000375.

Notes

1. Figures on industries' contributions to GDP and employment are taken from the Second Working Group Meeting of the OECD Eurasia Competitiveness Programme, "Innovation Policy for Competitiveness in Kazakhstan", 22 April 2015, Astana.
2. Samruk-Kazyna is a sovereign wealth fund wholly owned by the state and headed by the Prime Minister. It was created by decree in October 2008 with the merger of two funds, Samruk and Kazyna.
3. Further information on SEZs can be found at: www.kaznexinvest.kz/en/SEZ/economic_zones.php.
4. Tertiary education enrolment refers to the ratio of total tertiary enrolment to the population of the age group that officially corresponds to the tertiary level of education.
5. The firm sample for Eastern Europe and Central Asia (ECA) comprises the following 30 countries: Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, the Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kosovo, Kyrgyzstan, Latvia, Lithuania, Macedonia, Moldova, Mongolia, Montenegro, Poland, Romania, the Russian Federation, Serbia, the Slovak Republic, Slovenia, Tajikistan, Turkey, Ukraine and Uzbekistan.
6. Data are based on the UNESCO Institute for Statistics database for Kazakhstan and the Russian Federation, and on OECD.Stat for the OECD average.
7. The QS World University Rankings is based on six performance indicators designed to assess universities in four areas: research, teaching, employability and internationalisation. For further information, see: www.topuniversities.com.
8. The Bolashak programme provides scholarships to the best Kazakh students for master's and doctoral studies in leading international universities.
9. The governance of the research system has changed fundamentally from what it was in the past. Under the former Soviet system, universities

focused on training while public research institutes under the National Academy of Sciences were responsible for research. Following independence, the academy was re-established as an association with over 150 members, including Kazakhstan and foreign scientists, that would take on a consultative and advisory role. Many universities created their own research institutes; some public research institutes were merged with universities and others acquired a more independent status. Most of the remaining research institutes now depend either on the Ministry of Education and Science or on the Ministry of Investment and Development.

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Chapter 3.

Organisation of Kazakhstan's intellectual property system

This chapter provides an overview of the national intellectual property (IP) system of Kazakhstan. It looks at the principal IP laws and regulations, followed by a discussion of the country's main institutions related to IP, and their co-ordination. The operational and procedural aspects of the IP system are also outlined.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Kazakhstan's national intellectual property (IP) system has developed substantially since the country's independence in 1991, in terms of both the legislation on and the protection of intellectual property rights. The institutions from the past Soviet era, linked with IP registration and protection, have evolved in recent decades, and are more in line with international practice.

With its membership in the World Trade Organization (WTO) since 30 November 2015, Kazakhstan has adopted the standards of intellectual property protection set by the Agreement on Trade-related Aspects of Intellectual Property Rights (TRIPS). Membership of the Eurasian Economic Union has also led to a series of regional IP agreements.

The modernisation of Kazakhstan's IP system extends to its very organisation. The IP office has engaged in efforts to improve efficiency, and a range of support measures involving various institutions in the country has been created to promote the use of IP in view of supporting the country's innovation performance. There is, however, room for improvement in the allocation of different activities, and the co-ordination of support policies deserves attention in the interests of maximising impacts. Several IP rights laws are currently being amended with a view towards improving the protection of IP rights.

3.1. Overview of intellectual property laws and regulations

This section provides a brief survey of different IP rights in Kazakhstan.

3.1.1. Patents

There are several channels through which patent protection can be obtained in Kazakhstan. A Kazakh patent application can be filed with the patent office of Kazakhstan, including for invention patents and utility models. A Eurasian patent application can be filed either directly with the Moscow-based Eurasian Patent Office or via the national office of a state party to the Eurasian Patent Convention (EAPC). Kazakhstan is also party to the Patent Cooperation Treaty (PCT) and the Paris Convention; consequently, patent applicants can choose the PCT process and the Paris Convention process to obtain patent protection in Kazakhstan (Table 3.1).

Patent applications in Kazakhstan

In 1992, Kazakhstan was one of the first member countries of the Commonwealth of Independent States (CIS)[1] to adopt a new patent law that reflected global patent policy. A section dedicated to intellectual property in the Kazakhstan Civil Code was enacted in 1999, followed by a new Patent Law adopted the same year to conform to the Civil Code. The new law

incorporated changes to align regulation with international agreements in the field of industrial property protection, and to improve the enforcement of industrial property rights. This law forms the legal basis for current patent protection in Kazakhstan.[2]

Table 3.1. **Procedures for obtaining invention patent rights in Kazakhstan**

Procedure type	National procedure	Eurasian procedure	PCT procedure
Governing laws	National Patent Law	Eurasian Patent Convention	PCT national phase or the regional (Eurasian) phase's corresponding regulation
Substantive examination	Yes	Yes	Yes
Conversions	To utility model	To national application	
Language	Kazakh and Russian	Russian	Kazakh and Russian

Sources: Law on Patents of the Republic of Kazakhstan No. 427-I of 16 July 1999, http://online.zakon.kz/Document1032064; Eurasian Patent Convention, www.eapo.org/en/documents/norm/convention_txt.html.

The 1999 Civil Code stipulated three types of titles to be granted: invention patents, provisional patents (and later innovation patents) and utility model patents. Under this new system, invention patents – as specified in the TRIPS – have a term of 20 years from the date of filing. Consistent with international practice, invention patents are granted after a substantive examination, which includes examining compliance with the novelty and inventiveness requirements.

By an amendment of Kazakhstan's Patent Law, which came into force in April 2015, only utility models are now available to protect small or minor inventions. Prior to that, the provisional invention patent (until 2007) and the innovation patent (2007-15) were available. For both provisional/ innovation patents and utility models, only novelty assessment was conducted, providing rapid protection for small or minor inventions (Suthersanen, 2006). Innovation patents were granted from 2007 to 2014 for both products and methods for five years at most, while utility models were granted for products for eight years maximum. The novelty requirements for innovation patents were lower than for utility models. Prior to 2007, a provisional invention patent, valid for eight years at most, was granted after a preliminary examination of the application. The amendment, which abolished innovation patents, enlarged the subject matter of utility models to cover the subject eligibility of invention patents (Table 3.2).

Table 3.2. **Differences between invention patents, innovation patents and utility models**

Patent types	Invention patent	Innovation patent (abolished in April 2015)	Utility model
Eligible subject matter	Technical solutions in any field concerning a product or a process	Same as invention patent	Same as invention patent (products/devices only)
Patentability requirement	Novel, non-obvious, industrially applicable	Local (Kazakhstan) novelty, industrially applicable	Novel, industrially applicable
Prior art	All the information publicly available worldwide before the priority date	All the information publicly available in Kazakhstan before the priority date	All the information publicly available worldwide and the use thereof in Kazakhstan before the priority date
Terms of protection	20 years as of the date of filing, subject to up to 5 years' extension at the request of the patent holder	Three years as of the date of filing, subject to up to two years' extension at the request of the patent holder	Five years as of the date of filing, subject to up to three years' extension at the request of the patent holder
Examination process	Formal examination and substantive examination of novelty, inventiveness and industrial applicability	Formal examination and substantive examination of local novelty and industrial applicability	Formal examination required but substantive examination of novelty and industrial applicability not required
Other aspects	At any time during the application examination prior to the expert organisation rendering its opinion, convertible to utility model		

Source: Law on Patents of the Republic of Kazakhstan No. 427-I of 16 July 1999, http://online.zakon.kz/Document1032064.

Not all countries have utility model systems in place; in some of the leading economies, such as the United States, there is no such system and no international requirements. In the case of Kazakhstan, such a system can be valuable to encourage the wider protection of minor innovation outcomes in Kazakhstan as a stepping stone towards patenting. However, for the system to work effectively, there needs to be some stability (i.e. no further modifications in the type of IP protection available as was the case until 2015) so that innovators can be ensured of the type of protection they will receive. Moreover, obtaining utility models has to be more time efficient, less cumbersome and cheaper for this to be an attractive option relative to patents. The price for utility models is indeed cheaper than that for invention patents with the baseline online application cost for utility models at 80% of that for invention patents (Table 3.7).

Eurasian patents

Since 5 November 1995 Kazakhstan has been part of the Eurasian Patent Convention (EAPC). The Eurasian Patent Organization (EAPO) was set up as stipulated by the EAPC, which was signed in 1994, and came into force in 1995. The starting date for filing Eurasian applications was 1 January 1996 (EAPO, 2015a).[3] At present, the eight countries that are part of the EAPC are Armenia, Azerbaijan, Belarus, Kazakhstan, Kyrgyzstan, the Russian Federation, Tajikistan and Turkmenistan. Georgia, Ukraine and Uzbekistan were also the signatories to the Eurasian Patent Convention, but have so far not ratified it. The system provides a single application procedure to protect inventions on the basis of a single Eurasian patent valid in the territory of the eight states party to it (EAPO, 2015c).[4]

Eurasian patent applications can be filed either directly with the Moscow-based Eurasian Patent Office or via the national office of a state party to the EAPC. Issued patents are valid in Kazakhstan if patent annual maintenance fees are paid. For the Eurasian procedure, the criteria of patentability – i.e. novelty, inventiveness and industrial applicability – are in conformity with international standards. A Eurasian application can be filed in the national language of member states with a Russian translation (EAPO, 2015b). In 2014, the Eurasian patent applications from Kazakhstan numbered 78, with 19 granted. These were few compared with the numbers filed nationally.

PCT patents

Kazakhstan has also been party to the Patent Cooperation Treaty (PCT) since 25 December 1991. The PCT makes it possible to seek patent protection for an invention simultaneously in a number of countries by filing a single "international" application instead of several separate national or regional patent applications. The granting of patents, however, remains under the control of the national or regional patent offices (WIPO, 2015a).

3.1.2. Industrial designs

The Patent Law also governs the protection of industrial design in Kazakhstan. As is the case with international practice, industrial design protection can be obtained for an artistic and technical solution that defines the outward appearance of a manufactured article, and shall be granted after the formal and the substantive examinations of the application have been performed.

Industrial design rights were modified in 2012 by dropping the requirements regarding industrial applicability and extending the protection

period from 10 to 15 years. This covers the minimum period of protection set out internationally and applicable to all signatories of the Geneva Act (1999) of The Hague Agreement Concerning the International Registration of Industrial Designs, to which Kazakhstan is not a signatory.[5] Previously, an industrial design was awarded to designs that were new, original and industrially applicable.

Industrial design rights have been utilised to protect traditional knowledge (Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore, 2002). Examples of products that have received such protection include headdresses (*saykele*), carpets (*tuskiiz*), decorations of saddles, and national dwellings (*yurta*) and their structural elements, as well as bracelets (*blezik*), national children's cots/cribs/cradles and tableware (*piala*, *torcyk*) (Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore, 2001). Kazakhstan's Patent Law also allows the protection of different kinds of industrial designs (including 3D, 2D and a combination of these) if they are novel and genuine.

3.1.3. Trademarks and appellation of origin

The right to a trademark, service mark or appellation of origin (geographical indications) in Kazakhstan is set out in a 1999 law. Several amendments have been introduced over the years to improve the legal environment, particularly with a view to attracting more foreign investment.[6] Consistent with international practice, protection is provided for an initial term of ten years, which can be prolonged every ten years.

The 2015 amendments to the Trademark Law are set to bring about several changes to the trademark regime (Kenjebayeva, 2015; Zubenko and Smyrnova, 2015):

- Simplified registration of assignment and licensing agreements for trademarks when an inventor from a foreign country that is party to the Singapore Treaty is involved, in accordance with the provisions of the Singapore Treaty to which Kazakhstan adhered in 2012. In addition, the inventor will no longer be required to send licensing agreements to the patent office, although the obligation to register licensing agreements remains.
- Binding time limits for administrative decisions defined for all stages of the examination of trademark applications, in order to reduce the pendency time for registration.

- Establishment of a regional principle of exhaustion of trademark rights, to harmonise national legislation with the provisions of the Agreement on the Eurasian Economic Union (EAEU).
- No further issuing of registration certificates for trademarks. The right to a trademark is now testified by a notice in the State Register of Trademarks, which is a simpler process than certification. The aim is to better streamline the registration process.

3.1.4. Other types of intellectual property

Copyrights

Kazakhstan's new legislation, the Law on Copyright and Neighbouring Rights, was adopted on 10 June 1996, following the example of the Law of the Russian Federation "On Copyright Law and Neighbouring Rights" of 1993. Previously, since 1991, Kazakhstan had applied the provisions of the "Fundamentals of the Civil Legislation of the USSR and Union Republics".

The Law on Copyright was amended in 2004 to reflect Kazakhstan's adherence to the WIPO Internet Treaties, i.e. the WIPO Copyright Treaty (WCT) and the WIPO Performances and Phonograms Treaty (WPPT). Further amendments were made in 2012 to regulate the use of copyright works on the Internet, where administrative or criminal liability, depending on the damages caused, was introduced for illegal use of copyrighted works and violation of related rights on the Internet. In line with the TRIPS Agreement, the term of copyright protection in Kazakhstan is equal to the life of the author plus 70 years thereafter for literary, musical and artistic works, and 70 years after first release, performance or publication for films, sound recordings, broadcasts and performers.

Plant variety and animal breed

The Law on the Protection of Selection Achievements 1999, which was last amended in 2007, sets the conditions of protection for selection achievements in Kazakhstan: protection is provided for a plant variety or animal breed if it is new, distinct, uniform and stable. This corresponds to the definition of plant variety protection in the UPOV system (the International Union for the Protection of New Varieties of Plants), the international system set by the International Convention for the Protection of New Varieties of Plants aimed at incentivising breeders to develop new varieties of plants.[7] This type of protection, while not widely used to date in Kazakhstan, is important given the country's innovation potential in the agricultural sector (see Chapter 5).

Protection of topologies of integrated microcircuits

The Law on Legal Protection of Topologies of Integrated Microcircuits, in force since 2001, completes a series of legal acts on industrial property protection in Kazakhstan.[8] In compliance with the TRIPS Agreement, the topology of integrated microcircuits refers to the spatial and geometric position of sets of elements of integrated microcircuits and the links between them fixed on physical media. The term of protection is ten years starting from the date of registration.

3.1.5. International intellectual property agreements

Kazakhstan has implemented international IP standards since it became a member of the World Intellectual Property Organization (WIPO) in 1991. The treaties to which it is signatory include notably the Patent Cooperation Treaty, the Madrid Agreement and the Berne Convention (Table 3.3). These IP agreements allow Kazakhstan to meet critical international IP standards. Further efforts should concentrate on ensuring that legislative measures and practices required by these agreements are effectively adopted via domestic laws.

Table 3.3. **International intellectual property agreements signed by Kazakhstan**

Category	Treaty	Date entered into force
Patents	Paris Convention	December 1991
	Patent Cooperation Treaty	December 1991
	Budapest Treaty	April 2002
	Strasbourg Agreement	January 2003
	Patent Law Treaty	October 2011
Trademarks	Madrid Agreement (Marks)	December 1991
	Nice Agreement	April 2002
	Trademark Law Treaty	November 2002
	Madrid Protocol	December 2010
	Singapore Treaty	September 2012
Industrial designs	Locarno Agreement	November 2002
Copyright and related rights	Berne Convention	April 1999
	Phonograms Convention	August 2001
	WIPO Copyright Treaty	November 2004
	WIPO Performances and Phonograms Treaty	November 2004
	Rome Convention	June 2012
Flag of Kazakhstan with Olympic symbol	Nairobi Treaty	March 2011
Others	WIPO Convention	December 1991
	Eurasian Patent Convention	November 1995

Source: WIPO (2015b), "Kazakhstan's treaty membership", *WIPO Intellectual Property Laws and Treaties Database*, www.wipo.int/wipolex/en/profile.jsp?code=KZ.

3.1.6. International dimensions of Kazakhstan's intellectual property policy

Kazakhstan formally became member of the WTO in November 2015; it had been an accession country since February 1996 (WTO, 2015). The WTO signatory countries are required to establish a minimal level of IP protection under the TRIPS (Lesser, 2001). IP legislation in Kazakhstan has reached this minimal level with its accession to the WTO. Some of the main changes that were implemented in the process of adhering to the TRIPS include: 1) illicit goods that infringe IP need to be confiscated and destroyed; 2) increased protection for pharmaceutical companies' inventions of new kinds of medicine (other companies cannot use information on research and clinical tests or other confidential information obtained by the original inventors to seek IP rights); as well as 3) modified provisions regarding the possibility of issuing a compulsory license.[9]

Table 3.4. **Regional and bilateral treaties on intellectual property and related subjects signed by Kazakhstan**

Regional/bilateral	Treaty	Date entered into force
Commonwealth of Independent States (CIS)	Agreement concerning the Measures of Protection of Industrial Property and Establishing the Interstate Council for the Industrial Property	March 1993
	Agreement on Cooperation in the Field of the Protection of Copyright and Neighbouring Rights	May 1995
	Agreement on Cooperation in the Repression of Offenses in the Field of Intellectual Property	January 1999
	Agreement on Measures for the Prevention and Repression of the Use of False Trademarks and Geographical Indications	June 1999
	Agreement on Cooperation in Organization of Interstate Exchange of Information and Establishment of National Databases on Copyright and Related Rights	January 2000
	Agreement on Mutual Preservation of Inter-State Secrets in the Area of Legal Protection of Inventions	January 2000
	Agreement on Cooperation in the Area of Legal Protection of Intellectual Property and on Establishment of Interstate Council on Legal Protection of Intellectual Property	August 2011
European Community and its member states	Agreement on Partnership and Cooperation	June 1999
Eurasian Economic Community (EURASEC) (including Belarus, Russian Federation)	Agreement on Unified Principles of Regulation in the Spheres of Intellectual Property Rights Protection in the framework of Common Economic Space, later integrated into the EAEU Treaty	January 2012
Eurasian Economic Union	International treaty within the Eurasian Economic Union on the Coordination of Activities on the Protection of Intellectual Property Rights	Not yet entered into force (adopted in September 2015)
United States	Agreement on Trade Relations	February 1993
	Treaty concerning the Encouragement and Reciprocal Protection of Investment	January 1994

Table 3.4. **Regional and bilateral treaties on intellectual property and related subjects signed by Kazakhstan** (*continued*)

Regional/bilateral	Treaty	Date entered into force
Russian Federation	Agreement on cooperation in the field of industrial property protection	March 1994
	Agreement on mutual protection of rights to the results of intellectual activity used and received during bilateral military-technical co-operation	August 2005
Israel	Agreement for the Reciprocal Promotion and Protection of Investments	February 1997
Uzbekistan	Agreement in the Field of Industrial Property Protection	June 1997
Switzerland	Trade and Economic Cooperation Agreement	July 1997
Georgia	Agreement in the field of industrial property protection	November 1997
Azerbaijan	Agreement in the field of industrial property protection	October 1998
	Agreement on co-operation in the sphere of protection of copyright and neighbouring rights	October 1999
Armenia	Agreement on Free Trade	December 2001
Croatia	Agreement on trade and economic co-operation	April 2002
Uzbekistan	Agreement on co-operation in the field of protection of intellectual property rights	March 2006
France	Agreement on co-operation in the exploration and use of outer space for peaceful purposes (Annex – Intellectual Property)	October 2009

Sources: WIPO (2015b), "Kazakhstan's treaty membership", www.wipo.int/wipolex/en/profile.jsp?code=KZ; WIPO Lex, www.wipo.int/wipolex/en; information provided by Bolotov and Partners.

Kazakhstan is also member of the Commonwealth of Independent States Free Trade Area (CISFTA) and, as noted above, the Eurasian Economic Union (EAEU), which replaced the Eurasian Economic Community (EurAsEC, 2000-14).[10] As a member of these regional alliances, Kazakhstan signed several treaties on the protection of intellectual property for the purpose of guaranteeing compliance with the common principles of IP administration within the territories. The treaties specifically cover items such as the protection of regional geographic indications, parallel imports (i.e. imports of non-counterfeited products from another country without the permission of the IP owner) and enforcement procedures (Table 3.4). The 1999 Agreement with the European Union enhanced the protection of geographical indicators and unregistered industrial samples; responsibilised Internet providers in relation to IP infringements; and extended the range of the IP objects customs has to protect from IP infringements.

3.2. Governmental stakeholders and co-ordination mechanisms

Table 3.5 describes the Kazakh institutions involved in IP policy making, distinguishing the different roles linked to administrative and procedural matters.

IP-related matters cover a number of different policy areas and are thus, similar to many other countries, under the supervision of different ministries. This requires close collaboration among the public institutions with regard to IP matters. It is extremely important to establish more cross-institutional consultation in Kazakhstan and to clearly assign responsibilities, including ensuring that the Ministries of Education and Investment and Development and, more specifically, their agencies in charge of policy implementation, collaborate with regard to the issue of commercialisation of public research. Such co-operation across ministries and across implementing agencies needs to be informed by more informal and working-level co-ordination. In this way, policy initiatives covering all phases – from obtaining IP rights to the commercialisation and trading of IP, whether selling or licensing – are more complementary.

Table 3.5. **Kazakhstan's intellectual property system: An overview of institutions involved**

Role	Institution
Intellectual property governance	– Department on Intellectual Property Rights of the Ministry of Justice (formerly the Committee on Intellectual Property Rights) – National Institute of Intellectual Property, an independent legal body under the Ministry of Justice (for industrial property)
Intra-governmental consultation on intellectual property	– Foreign Investors' Council
Intellectual property administration	– National Institute of Intellectual Property (for industrial property) – Department on Intellectual Property Rights (for copyright) – State Inspection for Pedigree Breeds and the State Commission for Crop Variety Testing of the Ministry of Agriculture (plant varieties and animal breeds)
Intellectual property policy and support policies for intellectual property use	– Committee of Science of the Ministry of Education and Science – Ministry of Investment and Development – Department of International Economic Integration of the Ministry of National Economy –National Agency for Technological Development Joint Stock Company under the Ministry of Investment and Development – Technology Commercialization Center (TCC) under the Ministry of Education and Science[1]
Other entities of the intellectual property system	– Ministry of the National Economy (for intellectual property trade agreements) – Committee for the Control of Medical and Pharmaceutical Activities of the Ministry of Healthcare and Social Development (for IP matters related to pharmaceuticals) – Registered patent solicitors and intellectual property evaluators
Intellectual property enforcement	– Ministry of Justice, courts and police – Customs Control Department of the State Revenue Committee of the Ministry of Finance – Service of Economic Investigations under the State Revenue Department of the Ministry of Finance – Criminal Police Department of the Ministry of Internal Affairs

1. The World Bank Technology Commercialization Project concluded in December 2015, but a follow-up World Bank project entitled the "Fostering Productive Innovation Project" (2016-20) is under way. This will guarantee the continuation of the TCC, and comprises some additional instruments, such as the creation of an early-stage venture capital fund.

3.2.1. Intellectual property governance and intra-governmental consultations

In Kazakhstan, the Department on Intellectual Property Rights (formerly known as the Committee for Intellectual Property Rights) of the Ministry of Justice directs overall national policy and its implementation in the field of intellectual property, takes IP legislature initiatives and is responsible for representing national interests in international discussions. International matters regarding IP – including, in particular, recent discussion regarding the adoption of TRIPS in the context of WTO accession – are dealt with by the Department of International Economic Integration of the Ministry of National Economy.

IP is not widely discussed at intra-governmental level except within the Foreign Investors' Council (FIC), an advisory and consultative body. The FIC, chaired by the President of Kazakhstan, aims to develop recommendations and proposals to the President and the government of Kazakhstan on key aspects of the country's investment policy and economic development that are of concern to foreign investors (Kazakhstan Business Magazine, 2015). The protection of intellectual property rights was one of the important items discussed at a number of past meetings.

To date, Kazakhstan lacks structures that are sufficiently well defined to allow IP questions affecting national industry to be discussed in a cross-institutional setting. While creating an additional organisational structure may prove to be too cumbersome, it would be beneficial to at least institute an annual gathering to discuss IP matters that affect Kazakh nationals from the perspective of innovation. This would improve the exchange of perspectives on IP matters and facilitate decision making over legislation and policies that take local demands into account.

3.2.2. Intellectual property processing and enforcement

As regards the processing of IP applications, the National Institute of Intellectual Property (NIIP), an independent entity under the Ministry of Justice, receives applications and conducts the examination for industrial property, covering inventions, utility models, trademarks, geographical indications, industrial designs and selection achievements. The NIIP also conducts the examination and registration of contracts on transfer of rights for industrial property licensing and other agreements. In addition, the NIIP keeps the State Register of granted IP titles, with some overlaps in tasks with the Ministry of Justice.

Beyond industrial property, the Department on Intellectual Property Rights (previously the Committee for Intellectual Property) has been

overseeing and regulating matters related to copyright and related rights since its establishment in 2001.[11]

Regarding enforcement, apart from courts, the protection of intellectual property rights is also provided by the customs authorities. To date, no special IP court has been created. With the low number of cases, improving the capacity building of judges is a better alternative to creating such a specialised court.

Finally, as regards access to medical technologies and innovation, the Committee for the Control of Medical and Pharmaceutical Activities of the Ministry of Healthcare and Social Development deals with matters where public health and intellectual property meet, such as compulsory licences for drugs.

3.2.3. Policies supporting intellectual property use

Regarding policies to support IP use by national actors, the Ministry of Education and Science mainly supports universities and research institutes, while the Ministry of Investment and Development and its subsidiary, the National Agency for Technological Development (NATD), help national industrial development. There is some overlap of the two ministries in terms of functions and programmes, particularly as regards the commercialisation of basic and applied research (see Chapter 5). Both the Ministry of Investment and Development and the Ministry of Education and Science offer specific grants for IP registration by universities and private and state-owned firms. This may cause overlaps in terms of fund allocation.

3.3. Intellectual property operations and procedures

3.3.1. The National Institute of Intellectual Property: Institutional characteristics and functions

The National Patent Office (Kazpatent) was established in June 1992 in order to build a patent system following Kazakhstan's independence. The NIIP was set up in 2003 to take over the functions of the Kazpatent (Table 3.6). The current arrangement comes after several different organisational arrangements were tested.

The NIIP is an independent legal entity with personnel and financial autonomy, except for high-level management appointments from the Ministry of Justice. The NIIP's funding comes from the state budget of Kazakhstan as well as from the IP application, maintenance and consultancy fees that the NIIP receives. As of mid-2015, the NIIP had 160 staff, including examiners, administrators and technical staff. Most divisions are in charge of examining

and administering IP titles (Figure 3.1), reflecting the NIIP's main priorities, in addition to providing technical legal advice on IP matters.

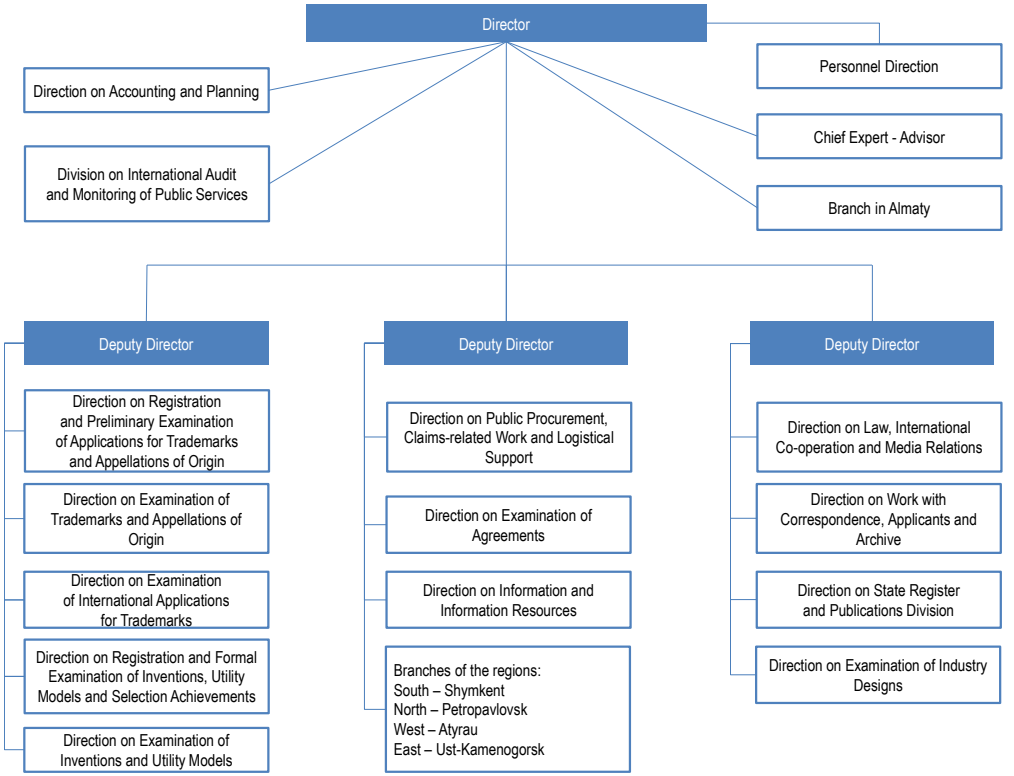
Table 3.6. **History of the National Institute of Intellectual Property and of related institutions**

Year	Event
1992	National Patent Office (Kazpatent) is established under the Cabinet Council
1992	State Copyrights and Related Rights Agency (SCRRA)
1996	Kazpatent is given independent status
1997	Kazpatent is placed under the Ministry of Industry and Trade, then under the Ministry of Economy and Trade due to a re-organisation of ministries
1997	The SCRRA is placed under the Ministry of Energy, Industry and Trade
1997-98	Kazpatent is placed under the Agency of Strategic Planning and Reforms
1998-2000	Kazpatent is placed under the Ministry of Energy, Industry and Trade
1999	The SCRRA is placed under the Ministry of Justice
2001	Committee for Intellectual Property Rights is established under the Ministry of Justice with direct responsibilities for the functions of the SCRRA
2001	State enterprise "Kazakhstan Institute of Patent Examination" (under the Committee for Intellectual Property Rights) established to succeed Kazpatent
2003	State enterprise "National Institute of Intellectual Property" (under the Committee for Intellectual Property Rights) established to succeed the "Kazakhstan Institute of Patent Examination"
2015	Committee for Intellectual Property Rights restructured as the Department on Intellectual Property Rights

Source: Interviews with representatives of the NIIP conducted in the context of this study and information at: http://kazpatent.kz/en/about-institute.

Apart from improving its examination procedures, the NIIP aims to help applicants better prepare their patent applications and to raise the profile of inventions. For this purpose, it has offered the services of its special Training Centre as well as external seminars. The NIIP has also organised joint seminars with WIPO and the National Chamber of Entrepreneurs. Since 2004, the NIIP has been organising invention competitions every year. General awareness activities are critical in a country such as Kazakhstan, where there is only very recent experience with IP and where there are few users to date. To improve its services, the NIIP has tried to improve its patent search system and its human resource training.

Figure 3.1. **The National Institute of Intellectual Property's organisational structure**



Sources: Interviews with representatives of the NIIP; information at: http://kazpatent.kz/en/structure-state-enterprise-national-institute-intellectual-property.

The NIIP is located in Astana and has several branch offices – in Petropavlovsk (Northern Office), Ust-Kamenogorske (Eastern Office), Shymkent (Southern Office), Atyrau (Western Office) and Almaty (Almaty Branch Office). This reflects the institute's efforts to strengthen outreach to all regions in Kazakhstan, for a wider geographic uptake by different actors of the country's IP system. The special unit in Almaty was established in 2006. Aside from a training centre, its Center for Patent Research provides consulting services for securing, exploiting and protecting IP (UNECE, 2012).

3.3.2. Disclosure of intellectual property information

The NIIP website offers an online search system for trademarks, patents and industrial designs. While the system provides bibliographic information for registered patents and industrial designs (title, abstract, filing date,

owner's name, etc.), no information is available for geographical indications. For granted patents, the full patent document is available with a description, summary and drawings. This complete information disclosure is useful to inform potential users. Drawings of industrial design rights are also made available.

Moreover, an online IP electronic bulletin was first introduced in 2001 to enable users to search for information and notifications related to trademarks, patents, industrial designs and geographical indications. Information includes, for instance, updates of IP rights that were recently granted as well as of IP rights for which protection has ended.

There are, however, shortcomings to the current system of IP information disclosure. The information is only available in Kazakh or Russian, but not in English. Taking into account the wide use of machine translation for patent information in major IP offices around the world, providing an English translation would help remove language barriers for foreign stakeholders to acquire knowledge of Kazakh technologies. Investment in a solid and easily searchable database would also be beneficial to both domestic and foreign stakeholders.

Moreover, access to the database "Security documents for inventions and utility models", the bibliographic database "Security documents", and the Official Bulletin "Industrial Property" (electronic version) is not available for free. These databases provide the key legal and technical information of IP granted in the country. Free, user-friendly access should be considered, as it helps promote awareness of IP and its adoption. An information platform on IP for easy public access would reduce innovators' and entrepreneurs' costs incurred in finding IP-protected technologies relevant to their business.

The most suitable platform would cover IP information from other countries, so that innovators and entrepreneurs in Kazakhstan can reach and understand a wide range of technical information. In order to achieve this objective, partnering with WIPO or other regional/national patent offices will be important. The NIIP could further develop IP services based on this information platform, to serve economic activities. It would also be good to keep the system for registering licences and noting changes in ownership for IP, which in the future can help with using IP – for example, for financing purposes.

3.3.3. Fees

The fees related to different types of IP rights are set by the Ministry of Justice. An overview of costs is shown in Table 3.7. Online filings are available and cheaper than those in paper form.

An increase in official fees was introduced by the NIIP in May 2015, for the first time in ten years (Smyrnova, 2015). For example, since 2015, the official fee for filing a trademark application covering up to three classes and the examination now costs Kazakhstani tenge (KZT) 14 110 (approximately USD 151), which is about 25% more than what applicants paid previously. For each additional class, applicants have to pay KZT 9 800 (approximately USD 105). The trademark registration fee has increased, now amounting to KZT 24 000 (approximately USD 258). Although this was an important increase, it should be noted that the NIIP fees had remained constant during the ten years prior to this revision.

Tariff reductions apply under specific circumstances. For example, a 15% discount on the examination fee for patent applications that include a valid international search report or an international preliminary examination report has been reintroduced. In addition, small and medium-sized enterprises that are residents of Kazakhstan are now entitled to a 20% discount on applications for patents, utility models, industrial designs and selection achievements, reducing the economic costs for SMEs for filing applications. Such reductions are smaller than in other countries. In Japan, Korea and the United States, SMEs enjoy a 50% patent fee reduction; in Europe, the patent fee reduction available for SMEs has increased from 20% to 30% since 2014. In the People's Republic of China (hereafter "China"), the fee reduction can be as high as 70%, and the fee schedule subject to reduction also extends to patent maintenance fees, re-examination fees, etc. An evaluation of changes in uptake of IP will be necessary in order to understand whether fees constrained uptake of IP by these businesses or whether other factors – notably including lack of awareness of the relevance of IP to SMEs' business activities – were holding back wider uptake.

Substantial tariff reductions also exist for IP filings for specific individuals (veterans, the disabled, students of secondary schools, vocational schools, university students). However, no fee reductions currently exist for researchers and universities; conceivably this imposes a rather high application cost on the group of actors with the highest potential for IP applications (see Chapters 2 and 5). Table 3.8 provides an overview of the maintenance fees for invention patents that apply to different groups of applicants.

Table 3.7. **Application and processing fees at the National Institute of Intellectual Property, 2015**

Category			Price including VAT			
			For legal entities	For small and medium-sized enterprises	For individuals	For veterans, the disabled, students of secondary schools, vocational schools, university students
Reception of applications and formal examination	Invention patent	Paper form	USD 218 (KZT 20 320)	USD 174 (KZT 16 256)	USD 65 (KZT 6 096)	USD 4.36 (KZT 406.56)
		Electronic form	USD 185 (KZT 17 271)	USD 148 (KZT 13 817)	USD 56 (KZT 5 181)	USD 3.70 (KZT 344.96)
	Utility model	Paper form	USD 176 (KZT 16 450)	USD 141 (KZT 13 160)	USD 53 (KZT 4 934)	USD 3.53 (KZT 329.28)
		Electronic form	USD 150 (KZT 13 982)	USD 120 (KZT 11 185)	USD 45 (KZT 4 194)	USD 3.00 (KZT 280.00)
	Industrial design	Paper form	USD 194 (KZT 18 039)	USD 155 (KZT 14 431)	USD 58 (KZT 5 411)	USD 3.87 (KZT 360.64)
		Electronic form	USD 165 (KZT 15 333)	USD 132 (KZT 12 267)	USD 49 (KZT 4 560)	USD 3.29 (KZT 306.88)
	Selection achievement	Paper form	USD 121 (KZT 11 240)	USD 96 (KZT 8 992)	USD 36 (KZT 3 372)	USD 2.42 (KZT 225.12)
		Electronic form	USD 103 (KZT 9 554)	USD 82 (KZT 7 643)	USD 31 (KZT 2 866)	USD 2.05 (KZT 191.52)
	Trademark, service mark and appellation of origin	Paper form			USD 178 (KZT 16 600)	
		Electronic form			USD 151 (KZT 14 110)	

Table 3.7. **Application and processing fees at the National Institute of Intellectual Property, 2015** (*continued*)

Category			Price including VAT			
			For legal entities	For small and medium-sized enterprises	For individuals	For veterans, the disabled, students of secondary schools, vocational schools, university students
Substantive examination of applications	Invention		USD 718 (KZT 66 959)	USD 575 (KZT 53 567)	USD 216 (KZT 20 088)	USD 14.37 (KZT 1 339.52)
		Accelerated	USD 862 (KZT 80 351)	USD 690 (KZT 64 281)	USD 259 (KZT 24 105)	USD 17.24 (KZT 1 607.20)
	Industrial design		USD 395 (KZT 36 804)	USD 316 (KZT 29 444)	USD 118 (KZT 11 041)	USD 7.89 (KZT 735.84)
Examination of the application for registration	Trademarks and service marks				USD 472 (KZT 44 000)	
	Appellations of origin (and/or the right to use)				USD 187 (KZT 17 400)	
Preparation of paperwork for issue of security documents and identification of the author, and the publication of information on the issue of security documents			USD 319 (KZT 29 691)	USD 179 (KZT 16 653)	USD 96 (KZT 8 907)	USD 6.37 (KZT 594.00)
Preparing for the issuance of security documents, issue of identity of the author, the publication of data on granting of selection achievements			USD 357 (KZT 33 254)	USD 285 (KZT 26 540)	USD 107 (KZT 9 976)	USD 7.14 (KZT 665.28)
Registration of trademarks, service marks and appellations of origin, and publication of information on registration					USD 258 (KZT 24 000)	

Note: Currency conversions have been calculated using PPP conversion factors provided by the World Bank. The conversion factor for 2014 has been used in this table, since the conversion factor for 2015 is not yet available. Full details of the conversion factors used are provided in Annex A.

Source: NIIP (2015), National Institute of Intellectual Property website, www.kazpatent.kz.

Table 3.8. **Maintenance fees for invention patents, 2015**

Number of years maintaining the patent	For legal entities	For individuals	For veterans, the disabled, students of secondary schools, vocational schools, university students
1-3	USD 218 (KZT 20 320.16)	USD 65 (KZT 6 096.16)	USD 4 (KZT 406.56)
4-5	USD 323 (KZT 30 150.40)	USD 97 (KZT 9 045.12)	USD 6 (KZT 602.56)
6-7	USD 421 (KZT 39 279.52)	USD 126 (KZT 11 783.52)	USD 8 (KZT 785.12)
8-10	USD 647 (KZT 60 295.20)	USD 194 (KZT 18 088.00)	USD 13 (KZT 1 206.24)
11-12	USD 858 (KZT 79 950.08)	USD 257 (KZT 23 984.80)	USD 17 (KZT 1 599.36)
13-15	USD 1 294 (KZT 120 574.72)	USD 388 (KZT 36 172.64)	USD 26 (KZT 2 411.36)
16-18	USD 1 505 (KZT 140 229.60)	USD 451 (KZT 42 069.44)	USD 30 (KZT 2 804.48)
19-25	USD 1 715 (KZT 159 875.52)	USD 515 (KZT 47 962.88)	USD 34 (KZT 3 197.60)

Note: Currency conversions have been calculated using PPP conversion factors provided by the World Bank. The conversion factor for 2014 has been used in this table since the conversion factor for 2015 is not yet available. Full details of the conversion factors used are provided in Annex A.

Source: NIIP (2015), National Institute of Intellectual Property website, www.kazpatent.kz.

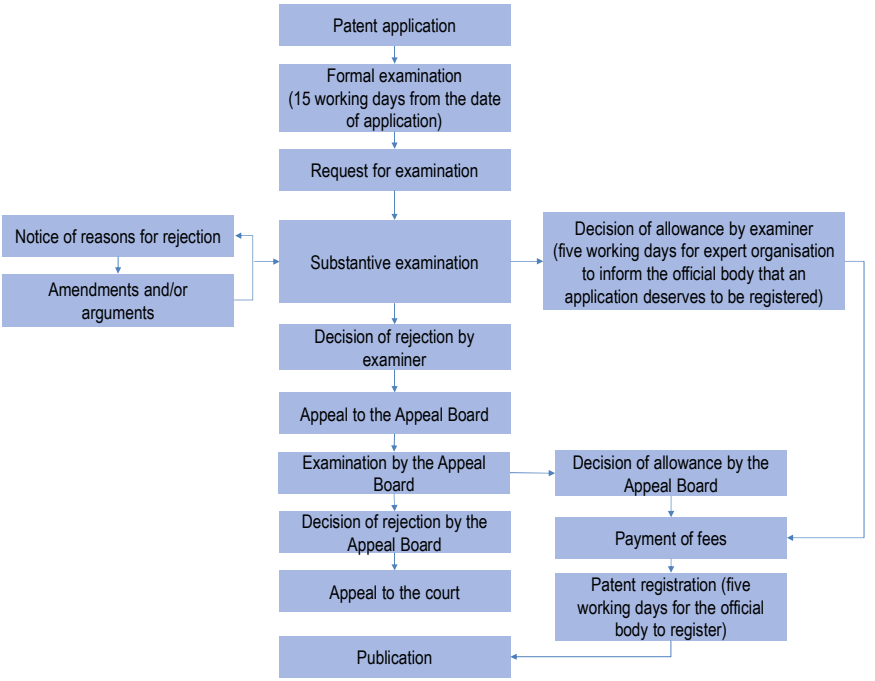
3.3.4. Processing and duration

Feedback from interviews suggests that users from universities, research institutes and law firms were generally satisfied with the performance of the NIIP regarding the speed of examination and registration.

Figures 3.2 and 3.3 describe the process involved from the application for an invention patent and trademark to the final granting and registration, respectively. The process for utility models and industrial designs is similar to that for invention patents. These processing procedures are similar to general practices worldwide.

Accelerated formal examinations and/or accelerated substantive examinations for inventions are available, provided that additional fees are paid. For trademark applications, an accelerated examination is available after a period of six months from the filing date of the application.

Figure 3.2. **The invention patent application process in Kazakhstan**

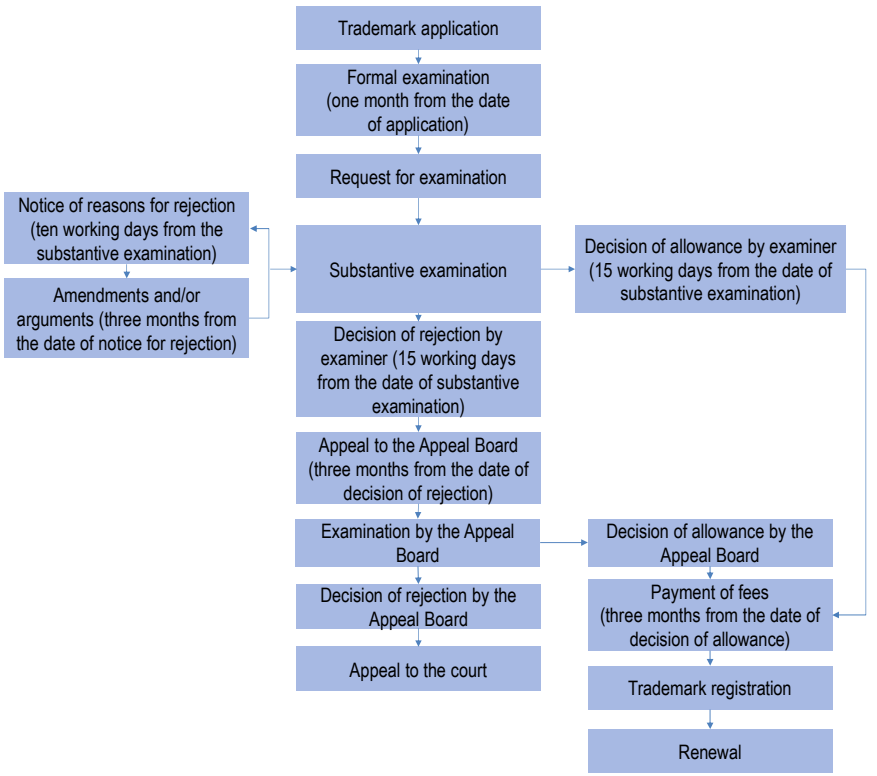


Source: Law on Patents of the Republic of Kazakhstan No. 427-I of July 16, 1999.

3.3.5. Intellectual property enforcement system

Kazakhstan's IP laws contain provisions for IP owners to take legal action against infringement of their IP rights by various judicial procedures. In civil IP cases, infringement of intellectual property is initiated by the IP owners, and remedies available include injunctions (the infringer will have to stop the infringing conduct and obtain a licence from the IP owner); damages (compensation of the losses suffered by the IP owner as a result of the infringement); and accounts of profits (the IP owner can claim the profits made by the infringer). Criminal sanctions for IP infringement exist under the Criminal Code, and the penalties include fines, correctional works, public works, arrest and imprisonment. Administrative responsibility for violation of the rights to IP objects is provided by Section 158 (on the illegal use of a trademark, service mark, trade name or appellation of origin) of the Code of Administrative Offences, and punishment includes a fine and confiscation of goods.

Figure 3.3. **The trademark application process in Kazakhstan**



Source: Law on Trademarks, Service Marks and Appellations of Origin of the Republic of Kazakhstan No. 456-I of July 26, 1999, http://online.zakon.kz/Document/?doc_id=1033141#pos=3;-326. Time periods are as indicated by the law.

While a number of reforms of the IP laws have facilitated the punishment of IP infringements and introduced more severe punishment for infringers of IP rights, reforms have not yet been applied by courts to the benefit of IP rights owners. According to our interviews with local attorneys, IP rights enforcement of copyright and related rights remains a major issue that requires further attention. One issue is that the institution of a criminal proceeding against the illegal use of a trademark currently requires the provision of evidence of large-scale damages. Thus, in practice, the number of criminal cases in this area is small. Allowing for the possibility of obtaining compensation as an alternative to the recovery of losses in cases of infringements of rights to trademarks and inventions could help address this problem, according to observers in Kazakhstan. Local attorneys interviewed in the context of this review also stressed that strengthening the combat against

unfair competition practices is needed to prevent companies in Kazakhstan from registering in bad faith other companies' trademarks or similar trademarks.

The number of IP suits in Kazakhstan is still small, as IP rights are not used much in the economy. Consequently it is understandable that, as mentioned above, there is no special IP court set up in the judicial system. Yet with more intensive use of IP, the need for specialised courts might emerge, specifically as the functions of regional courts on IP matters have been reduced. Ensuring that IP rights holders find the legal system accessible should they feel their rights are infringed is critical for IP titles to have effective value and, consequently, for different stakeholders to seek IP protection.

Other policy measures to support IP enforcement include intensified customs controls to reduce the import of IP-infringing goods. Some observers have argued that customs controls need to be strengthened to more effectively ensure that infringed goods are captured. A further effort that has been undertaken is the provision of training on IP matters for the country's judges, but more efforts are needed to improve judges' expertise on IP matters. The Supreme Court directly oversees the provision of such training to judges.

3.4. Challenges for Kazakhstan's intellectual property policy

Stakeholders frequently refer to the challenges faced by Kazakhstan's IP system and to the advantages that would be obtained from addressing such challenges (Table 3.9).

Table 3.9. **Issues and challenges faced by Kazakhstan's intellectual property system**

Aspect	Issues and challenges
Institutional	– Co-ordinating inter-ministry efforts among the Ministry of Justice, Ministry of Education and Science, and Ministry of Investment and Development, to address intellectual property issues that affect national innovation performance
Policy related	– Proposing and revising intellectual property laws and regulations to further promote national innovation performance – Optimising and linking intellectual property-related policies for public research funded by different ministries – Proposing initiatives to raise general intellectual property awareness, to promote economic development in targeted agricultural and industrial sectors
Operational	– Maintaining quality service by the National Institute of Intellectual Property (NIIP), including further improving the skills and tools of examiners, advancing the use of ICT – Providing free, open and user-friendly access to information on industrial property – Promoting greater awareness of intellectual property among stakeholders – Extending the scope of services on intellectual property valuation for the NIIP, including capacity building in this aspect

Notes

1. At present the CIS comprises: Azerbaijan, Armenia, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, the Russian Federation, Tajikistan, Turkmenistan, Uzbekistan and Ukraine.
2. The law was amended on 9 July 2004, 2 March 2007, 31 January 2012 and 7 April 2015, modifying available patent protections and adjusting to international requirements.
3. The Eurasian Patent Convention entered into force in the Republic of Moldova on 16 February 1996; however, that country deposited a notification of denunciation of the Eurasian Patent Convention that took effect on 26 April 2012 (WIPO, 2012).
4. Currently other states parties to this Convention include: Azerbaijan, Armenia, Belarus, Kyrgyzstan, the Russian Federation, Tajikistan and Turkmenistan.
5. The time frame in Kazakhstan for the protection period was amended by the Law of the Republic of Kazakhstan No. 537-IV of January 12, 2012, "on amendments and additions to some legislative acts of the Republic of Kazakhstan on issues of intellectual property", http://adilet.zan.kz/Z1200000537 (accessed 30 May 2016).
6. The Law on Trademarks, Service Marks and Appellations of Origin of 1999 was passed on 26 July 1999 and entered into force on 4 September 1999. Amendments were introduced in 2004, 2005, 2007, 2011, 2012 (twice) and 2015 (three times).
7. The UPOV System of Plant Variety Protection, www.upov.int/about/en/upov_system.html#what_is_a_pv (accessed 3 February 2016).
8. Notes of the country brief on the Republic of Kazakhstan can be found on the Eurasian Patent Organization's (EAPO) website at: www.eapo.org/en/publications/reports/report1999/8_5_kaz.html.
9. Compulsory licenses shall be issued in the first place for the domestic market, except in cases where such a license is sought for a remedy for the purposes of exports to the territory in which there are no or insufficient manufacturing facilities in accordance with international treaties, ratified by the Republic of Kazakhstan. Compulsory licenses for semiconductor technologies can only be issued for non-commercial use by the government, or be intended to correct practices that judicial or administrative procedures have identified as anti-competitive.
10. Currently, the EAEU has five member countries: Armenia, Belarus, Kazakhstan, Kyrgyzstan and the Russian Federation. Belarus, Kazakhstan, Kyrgyzstan, the Russian Federation, Tajikistan and Uzbekistan were members of EURASEC.
11. Previously, the State Copyrights and Related Rights Agency (SCRRA) handled copyright issues.

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Chapter 4.

Intellectual property use in Kazakhstan: Statistics

This chapter reviews the available statistical evidence on the use of intellectual property in Kazakhstan. The chapter analyses the uptake of different types of intellectual property in Kazakhstan: patents, utility models, trademarks, industrial designs, geographical indications and copyrights. It draws on data from Kazakhstan's National Institute of Intellectual Property (NIIP), the World Intellectual Property Organization (WIPO), and the World Bank's World Development Indicators. Kazakhstan's performance is compared to that of other economies, with particular attention to neighbouring member countries of the Eurasian Economic Union (EAEU).

Use of intellectual property (IP) in Kazakhstan has always been relatively weak and has changed little over the past decade. This suggests that the country's fast economic growth (see Table 2.1 in Chapter 2) has not resulted from growth in innovative outputs, including in the use of IP titles.

Patent applications by residents per million population were only 101 in 2014, which represents an intermediate position within the five Eurasian Economic Union (EAEU) countries: lower than in the Russian Federation (167), but higher than in Belarus (69), Armenia (40) and Kyrgyzstan (23). These numbers are very low compared to advanced countries such as the People's Republic of China (587; hereafter "China"), Germany (595), the United States (894) or Japan (2 093). In the past ten years, the position of Kazakhstan in the global ranking of resident patent applications has moved from 25th position in 2004 to 26th in 2013 (WIPO, 2015a). In terms of trademark applications, Kazakhstan moved from 53rd to 59th position over the same period.

Total annual patent applications by residents increased from 1 393 in 1994 to 1 742 in 2014, a rise of 25%. Meanwhile, annual trademark applications by residents increased fivefold, from 508 in 1994 to 2 558 in 2014. Use of utility models and industrial designs is particularly low in Kazakhstan, with just 139 and 107 total applications by Kazakh residents in 2014, respectively (Table 4.1).

4.1. Patents

In 2014, 87% of applications for patents in Kazakhstan were filed by residents. Since 1994, residents have filed an average of 1 484 patent applications per year (Figure 4.1). Non-residents have filed 202 applications per year on average in Kazakhstan over the same period. Patent applications in foreign offices by Kazakh residents were few prior to 2003 but experienced an increase thereafter, reaching 633 in 2014.

In Kazakhstan, the annual number of patent applications by residents was relatively stable from 2004 to 2014, similar to the evolution observed in Hungary (Figure 4.2). The growth rate of resident patent applications was higher in some Eastern European countries such as Poland, and even higher in Southeast Asian countries such as Malaysia or Thailand.

Table 4.1. **Resident and non-resident intellectual property applications, by filing office, 2014**

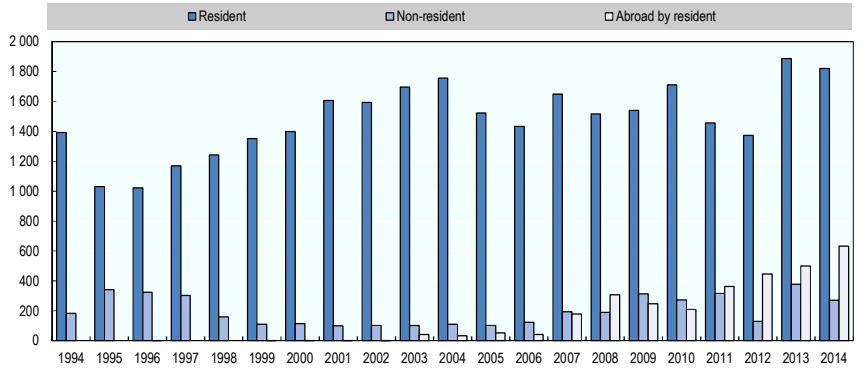
	GDP per capita (current USD)	GDP (current USD billion)	Population (million)	Patents		Utility models		Trademarks	Industrial designs	
				Resident	Non-resident	Resident	Non-resident	Resident	Resident	Non-resident
Kazakhstan	12 602	218	17.3	1 742	271	139	64	2 558	107	193
				(87%)	(13%)	(68%)	(32%)	(25%)	(36%)	(64%)
Russian Federation	12 736	1 861	143.8	24 072	16 236	13 000	952	34 175	2 200	2 984
				(60%)	(40%)	(93%)	(7%)	(56%)	(42%)	(58%)
Belarus	8 040	76	9.5	652	105	418	67	2 055	143	186
				(86%)	(14%)	(86%)	(14%)	(23%)	(43%)	(57%)
Armenia	3 874	12	3	121	2	53	5	1 342	27	209
				(98%)	(2%)	(91%)	(9%)	(28%)	(11%)	(89%)
Kyrgyzstan	1 269	7	5.8	132	7	8	2	274	47	198
				(95%)	(5%)	(80%)	(20%)	(9%)	(19%)	(81%)
India	1 582	2 049	1 295.3	12 040	30 814	..	..	200 137	6 168	3 141
				(28%)	(72%)			(90%)	(66%)	(34%)
China	7 590	10 355	1 364.3	801 135	127 042	861 053	7 458	1 997 014	548 428	16 127
				(86%)	(14%)	(99%)	(1%)	(95%)	(97%)	(3%)
Germany	47 774	3 868	80.9	48 154	17 811	10 947	3 794	63 011	6 616	776
				(73%)	(27%)	(74%)	(26%)	(89%)	(90%)	(10%)
Japan	36 194	4 602	127.1	265 959	60 030	5 429	1 666	100 036	24 868	4 870
				(82%)	(18%)	(77%)	(23%)	(80%)	(84%)	(16%)
United States	54 630	17 419	318.9	285 096	293 706	..	..	283 230	20 320	15 058
				(49%)	(51%)			(83%)	(57%)	(43%)

Notes: .. = not available. Total patent applications include direct and Patent Cooperation Treaty (PCT) national phase entries in the Kazakhstan Patent Office. Figures in brackets correspond to shares over total applications.

Sources: WIPO (2015b), "Intellectual property statistics", *WIPO Statistics Database*, www.wipo.int/ipstats/en#data for figures on patents, utility models, trademarks and industrial design application; World Bank (2016), *World Development Indicators*, http://data.worldbank.org/data-catalog/world-development-indicators for GDP per capita, GDP and population, based on *International Comparison Program database*.

The largest share (43.5%) of patent applications from 2007 to 2014 came from residents in Almaty, the country's largest city and former capital, followed by the present capital Astana (Figure 4.3). The shares of the industrial regions Karaganda and East Kazakhstan, and of the agricultural region of South Kazakhstan, were also relatively high, at well over 6% in all three regions.

Figure 4.1. **Patent applications in Kazakhstan**

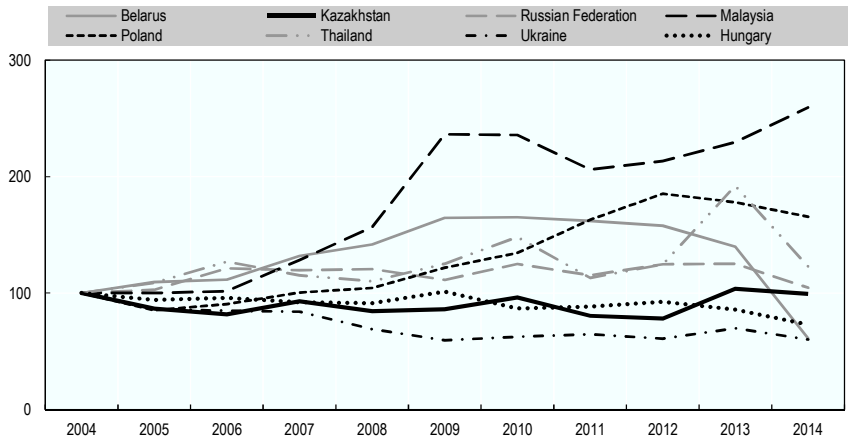


Notes: A resident application is one filed with an IP office by an applicant residing in the country in which that office has jurisdiction. A non-resident application is one filed with a patent office of a given country/jurisdiction by an applicant residing in another country. An application abroad is filed by a resident of a given country/jurisdiction with a patent office of another country/jurisdiction.

Source: WIPO (2015b), "Intellectual property statistics", www.wipo.int/ipstats/en#data. Data on resident and non-resident patents for 2012 were gathered from the NIIP, as non-resident patent data were not available from the *WIPO Statistics Database*.

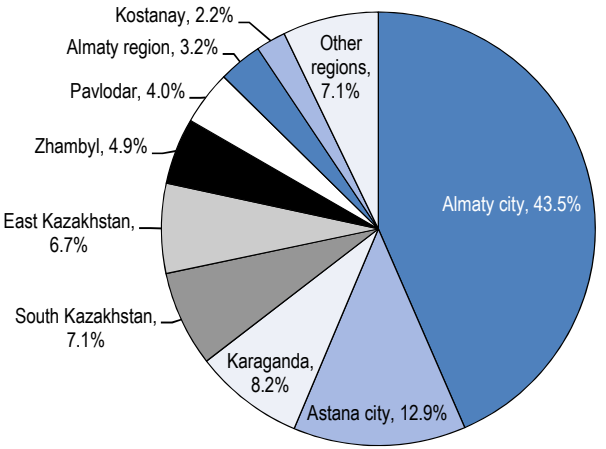
Figure 4.2. **Evolution of resident patent applications in Kazakhstan and selected countries**

2004 = 100



Source: WIPO (2015b), "Intellectual property statistics", *WIPO Statistics Database*, www.wipo.int/ipstats/en#data.

Figure 4.3. **Distribution of patent applications in Kazakhstan by region, 2007-14**

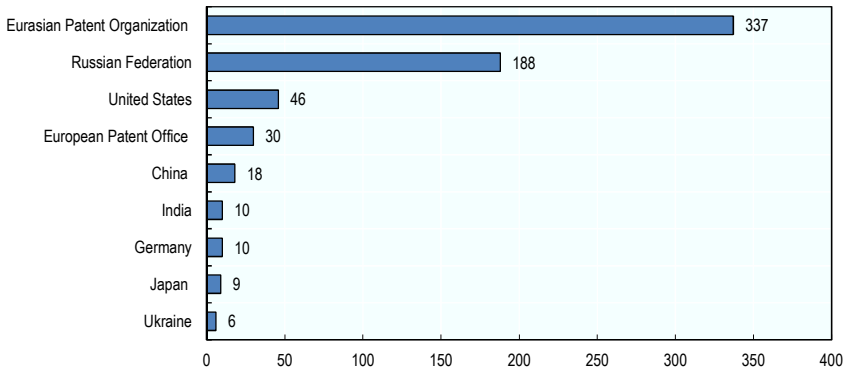


Note: Almaty region and Almaty city are separate administrative entities.

Source: NIIP (2015), *Annual Report 2014*.

Figure 4.4. **Top destinations of patent applications by applicants from Kazakhstan, 2007-14**

Total number of patent applications by Kazakh residents



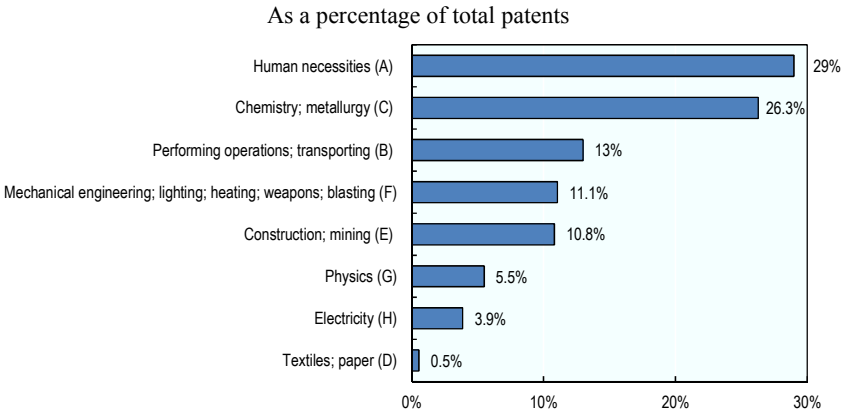
Notes: Count by filing office and applicant origin. Total number of applications received, including direct filings and PCT national phase entries. Only countries with more than five total filings in the period are displayed in the figure.

Source: WIPO (2015b), "Intellectual property statistics", *WIPO Statistics Database*, www.wipo.int/ipstats/en#data.

With regard to international patent applications, the number of patents filed in Kazakhstan under the Patent Cooperation Treaty (PCT) has been low in the past years. This suggests that very few Kazakh technologies have commercial value in international markets. On average, between 2000 and 2014, just 14 PCT patent applications were filed by Kazakh residents per year, reaching 21 in 2014 (WIPO, 2015b).

Figure 4.4 shows the top patent office destinations of applications from residents of Kazakhstan between 2007 and 2014. The Eurasian Patent Organization is the top destination for Kazakh applicants, with a total of 337 filings during that period, followed by the Russian Federation (188), the United States (46) and the European Patent Office (30). This underscores the relatively strong uptake that the Eurasian Patent has had in Kazakhstan compared with other destinations abroad, although the total number of Eurasian patent filings by Kazakh residents over the period 2007-14 is much lower than that of residents of Belarus (871) or the Russian Federation (2 471). During the same period, on average there were just six annual filings to the United States Patent and Trademark Office and four to the European Patent Office.

Figure 4.5. **Patents granted to residents in Kazakhstan by technology field, 2014**



Notes: Based on a total of 1 294 patents granted to residents in Kazakhstan in 2014. Class letters in brackets correspond to the International Patent Classification (IPC) system under the Strasbourg Agreement. Full details of this system can be accessed at: www.wipo.int/classifications/ipc/en. Class A includes agriculture; foodstuffs and tobacco; personal or domestic articles; health, lifesaving, amusement. Class B includes separating and mixing; shaping; printing; transporting; micro-structural technology and nanotechnology. Class C includes chemistry; metallurgy; combinatorial technology. Class D includes textiles or flexible materials not otherwise provided for; paper. Class E includes building; earth or rock drilling; mining. Class F includes engines or pumps; engineering in general; lighting; heating; weapons; blasting. Class G includes instruments; nucleonics. Class H includes electricity.

Source: NIIP (2015), *Annual Report 2014*.

By technology field, the patents most frequently granted to residents by the Kazakhstan patent office in 2014 were classified as "human necessities" – which includes agriculture and food products as well as health items – and chemistry and metallurgy (Figure 4.5). The distribution of patents by technology field partly reflects Kazakhstan's technological specialisation in agriculture and food as well as the stronger use of patents within certain sectors, such as pharmaceuticals and chemicals.

4.2. Utility models

Utility models often prove a useful tool for small and medium-sized enterprises (SMEs) and businesses in emerging countries, since they are easier to obtain than patents and can serve as stepping stones to obtaining full patents later on (OECD, 2014). However, Kazakh residents barely use the utility model system. In 2014, only 139 resident applications for utility models were filed, and the annual average for 2003-12 was just 35. Use of utility models in Kazakhstan is low not only in absolute terms, but also relative to the use of patents. In 2014, there were 12.5 resident patent applications for every utility model application (Table 4.2). This ratio is slightly lower than in Kyrgyzstan or Malaysia but much higher than in other countries in the region, such as Armenia, Belarus and the Russian Federation. The ratio is particularly low in some emerging countries such as China, Thailand and Ukraine.

Table 4.2. **Ratio of resident patent applications to resident utility model applications for selected countries, 2014**

Country	Resident patent applications	Resident utility model applications	Ratio of patent applications to utility model applications
Armenia	121	53	2.3
Belarus	652	418	1.6
China	801 135	860 892	0.9
Hungary	546	248	2.2
Kazakhstan	**1 742**	**139**	**12.5**
Kyrgyzstan	132	8	16.5
Malaysia	1 353	86	15.7
Poland	3 941	986	4
Russian Federation	24 072	12 995	1.9
Thailand	1 006	1 666	0.6
Ukraine	2 457	9 243	0.3

Source: WIPO (2015b), "Intellectual property statistics", *WIPO Statistics Database*, www.wipo.int/ipstats/en#data.

As a step toward encouraging the use of utility models, it is worth reviewing and simplifying the application and registration procedures and costs. It will also be important to inform potential users of the new regulatory provisions that expand their subject matter to methods previously covered by now-abolished "innovation patents" (see Chapter 3). Ensuring the application in practice of this new regulatory framework, which comprises a useful two-stage system (i.e. with utility models as a stepping stone to more demanding invention patents), is critical for further use of utility models in Kazakhstan. Another issue to be addressed is the limited attention given to utility models in government policies that support the use of IP, which may explain why researchers in government institutions tend not to use utility models (OECD, 2015).

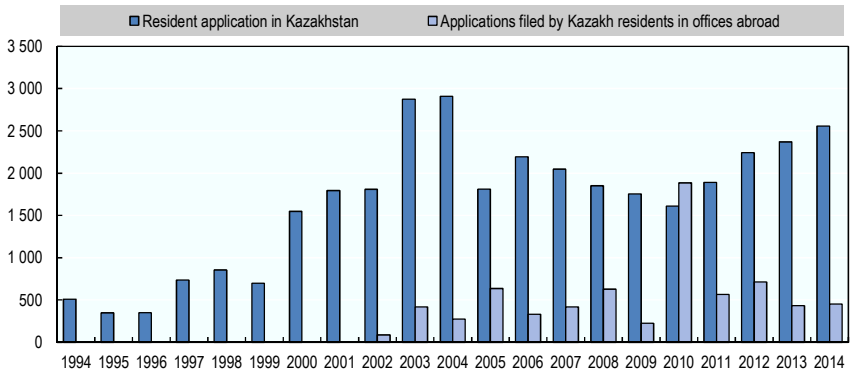
4.3. Trademarks

Trademarks are also relevant to innovation (Mendonça, Santos Pereira and Mira Godinho, 2004). Trademarks are a good indicator of product innovation since they are associated with the process of marketing new products and services. Since trademarks are not directly associated with technological innovations, as is the case with patents, they are used for the innovation activities of a wider group of actors – including a large number of SMEs that lack technical capacity but nonetheless engage in non-technical innovations – and in a wider set of sectors where technology is less important, including a number of services.

The number of trademark applications by residents in Kazakhstan has remained relatively stable since 2000, at around 2 000 applications per year (Figure 4.6).

In contrast to patent and utility model applications, the number of trademark applications from non-residents (7 520 in 2014) is much higher than the number of applications from residents (2 558). In comparison with the other four EAEU countries (Table 4.1), the number of trademark applications in Kazakhstan and their distribution by residence of the applicant are close to those of Armenia and Belarus, whereas in the Russian Federation resident filings are more numerous than non-resident filings.

Figure 4.6. **Trademark applications in Kazakhstan**



Notes: Data correspond to total trademark applications, direct and via the Madrid system. Data on resident applications for 2005-07 were gathered from the NIIP, since they were unavailable from WIPO.

Source: WIPO (2015b), "Intellectual property statistics", *WIPO Statistics Database*, www.wipo.int/ipstats/en#data.

Overall, most trademarks registered in Kazakhstan were in the pharmaceuticals, business services, machinery and foodstuff sectors (Table 4.3). The share of registered trademarks held by locals is relatively high in business services and foodstuffs, while foreigners registered a particularly high share of trademarks related to chemicals (including pharmaceuticals), machinery and clothing. In all top ten trademark classes, however, foreigners account for the lion's share of total registrations.

Table 4.3. **Top 10 trademark registrations in Kazakhstan, by class, 2013**

Rank	Type	Registrations (and % of total)	Local applicants	As a % of local applicants by class
1	Pharmaceuticals (Class 5) Including pharmaceutical and veterinary preparations; sanitary preparations for medical purposes; disinfectants	2 306 (10%)	507	22%
2	Business services (Class 35) Advertising; business management; business administration; office functions	2 122 (9%)	904	43%
3	Machinery (Class 9) Including scientific, photographic, optical instruments; apparatus for recording sound or images; data processing equipment and computers	1 297 (6%)	256	20%

Table 4.3. **Top 10 trademark registrations in Kazakhstan, by class, 2013** (*continued*)

Rank	Type	Registrations (and % of total)	Local applicants	As a % of local applicants by class
4	Foodstuffs of plant origin prepared for consumption or conservation as well as auxiliaries intended for the improvement of the flavour of food (Class 30) Including coffee, tea, bread, pastry and confectionery, ice cream; honey, treacle; yeast, baking powder; salt, mustard; vinegar, sauces (condiments); spices; ice for refreshment	1 064 (5%)	385	36%
5	Chemicals (Class 3) Bleaching preparations and other substances for laundry use; cleaning, polishing, scouring and abrasive preparations; soaps; perfumery, essential oils, cosmetics, hair lotions; dentifrices	1 031 (4%)	182	18%
6	Clothing (Class 25) Including clothing, footwear, headgear	975 (4%)	163	17%
7	Science services (Class 42) Scientific and technological services and research and design relating thereto; industrial analysis and research services; design and development of computer hardware and software	788 (3%)	224	28%
8	Meat and fish products (Class 29) Meat, fish, poultry and game; meat extracts; preserved, frozen, dried and cooked fruits and vegetables; jellies, jams, compotes; eggs, milk and milk products; edible oils and fats	749 (3%)	265	35%
9	Stationery (Class 16) Paper, cardboard and goods made from these materials not included in other classes; printed matter; bookbinding material; photographs; stationery; adhesives for stationery or household purposes; artists' materials; paint brushes; typewriters and office requisites (except furniture); instructional and teaching material (except apparatus); plastic materials for packaging not included in other classes; printers' type; printing blocks	677 (3%)	176	26%
10	Education and entertainment services (Class 41) Including education; provision of training; entertainment; sporting and cultural activities	674 (3%)	235	35%

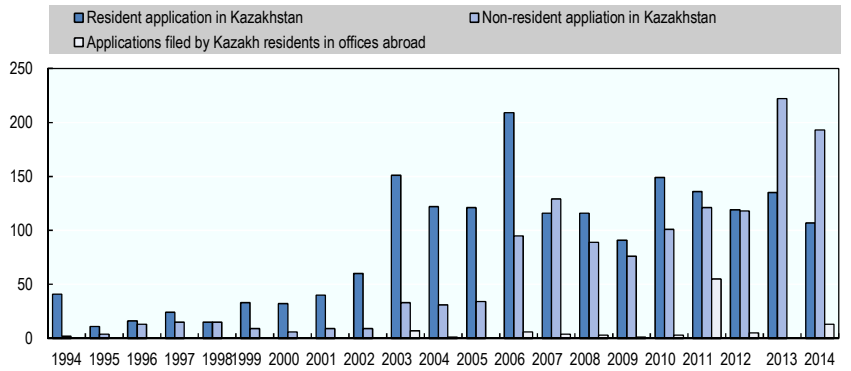
Note: Class numbers in parentheses correspond to the international classification of goods and services under the Nice Agreement. Full details of this classification system can be accessed at: www.wipo.int/classifications/nice/en/index.html.

Source: WIPO (2015b), "Intellectual property statistics", *WIPO Statistics Database*, www.wipo.int/ipstats/en#data.

4.4. Industrial designs

As with utility models, applications for industrial designs are few in Kazakhstan. In 2014, there were as many as 16.3 patent applications for every industrial design application (Table 4.4). Although the numbers remain very low, an increase in the use of industrial designs can be observed from 2003 onwards compared to the 1990s (Figure 4.7). Between 2004 and 2014, the annual average of industrial design applications by residents was 129, while the average number of applications by non-residents was 110. Applications by Kazakh residents in foreign offices are almost negligible, at less than 11 per year on average over the period 2006-14.

Figure 4.7. **Industrial design applications in Kazakhstan**



Notes: Data correspond to total applications, direct and via the Hague system. Data on resident applications for 2005-07 were gathered from the NIIP, since they were unavailable from WIPO. Data for applications by residents abroad are not available for 1999-2002, 2005 and 2013.

Sources: WIPO (2015b), "Intellectual property statistics", *WIPO Statistics Database*, www.wipo.int/ipstats/en#data; NIIP (2015), *Annual Report 2014.*

Table 4.5 presents the top ten industrial design classes in terms of registrations in 2013. The most frequent class was "Packages and containers for the transport or handling of goods", followed by "Stationery and office equipment; artists' and teaching materials". The share of registered industrial designs held by locals is higher in "Clothing", "Furniture and furnishing items", and "Stationery and office equipment; artists' and teaching materials", while foreigners registered a particularly higher share in "Pharmaceutical and cosmetic products; toilet articles and apparatus" and "Building units and construction elements".

Table 4.4. **Ratio of resident patent applications to resident industrial design applications for selected countries, 2014**

Country	Resident patent applications	Resident industrial design applications	Ratio of patent applications to industrial design applications
Armenia	121	27	4.5
Belarus	652	143	4.6
China	801 135	548 428	1.5
Hungary	546	209	2.6
Kazakhstan	**1 742**	**107**	**16.3**
Kyrgyzstan	132	47	2.8
Malaysia	1 353	827	1.6
Poland	3 941	1 138	3.5
Russian Federation	24 072	2 200	10.9
Thailand	1 006	3 026	0.3
Ukraine	2 457	2 047	1.2

Source: WIPO (2015b), "Intellectual property statistics", *WIPO Statistics Database*, www.wipo.int/ipstats/en#data.

Table 4.5. **Top 10 industrial design registrations in Kazakhstan, by class, 2013**

Rank	Details	Registrations (and percentage of total)	Local applicants	Percentage of local applicants by class
1	Packages and containers for the transport or handling of goods (Class 9)	81 (34%)	34	42%
2	Stationery and office equipment; artists' and teaching materials (Class 19)	37 (15%)	29	78%
3	Building units and construction elements (Class 25)	27 (11%)	1	4%
4	Pharmaceutical and cosmetic products; toilet articles and apparatus (Class 28)	12 (5%)	0	0%
5	Clothing (Class 2)	9 (4%)	9	100%
6	Means of transport or hoisting (Class 12)	9 (4%)	1	11%
7	Equipment for production, distribution or transformation of electricity (Class 13)	8 (3%)	3	38%
8	Fluid distribution equipment; sanitary, heating, ventilation and air conditioning equipment; solid fuel (Class 23)	7 (3%)	1	14%
9	Furniture and furnishing items (Class 6)	6 (3%)	5	83%
10	Machines, not elsewhere specified (Class 15)	6 (3%)	1	17%

Note: Class numbers in brackets correspond to the international classification of industrial designs under the Locarno Agreement. Full details of this classification system can be accessed at: www.wipo.int/classifications/locarno/en.

Source: WIPO (2015b), "Intellectual property statistics", *WIPO Statistics Database*, www.wipo.int/ipstats/en#data.

4.5. Geographical indications

As of December 2015 there were 37 geographical indications (GI) registered in Kazakhstan's IP office. Among these, 32 were granted after 2011, illustrating the very recent uptake of GI in the country. This can be largely explained by the recent increase in the country's attractiveness as an export destination for foreign producers of GIs, as well as to the improvement and simplification of procedures for obtaining and protecting GI in Kazakhstan.

Most of the GIs registered in Kazakhstan correspond to foreign products. Georgia has been granted 22 GIs in Kazakhstan for different varieties of wine and mineral water, followed by the Russian Federation with 5 GIs for vodka and mineral water. There are also GIs for two Czech products (Budweiser Budvar beer and Becherovka liqueur) as well as an Italian one (Parmigiano Reggiano cheese).

Only five GIs correspond to Kazakh products. These include two GIs for mineral water (Saryagash and Akzhayik), a dairy product (Rudny Tan), a traditional food specialty (Kezhe Rudny) and a ground water hydrology service (Akzhayik).

4.6. Copyrights

Since copyright protection does not require registration in an IP office, there are not any readily available statistics to measure its volume or evolution. However, a growing number of countries are producing statistics to assess the economic contribution of copyright-based industries. Since 2002, the World Intellectual Property Organization (WIPO) has been supporting research on assessing the economic contribution of copyright industries.[1] On average, these industries contributed 5.18% to gross domestic product (GDP) and 5.32% to total employment in the 42 countries covered so far by WIPO studies (WIPO, 2014). Kazakhstan has not yet taken part in such estimations, and statistics on the copyright industries for the country appear to be unavailable. Given the importance of the copyright industries in modern knowledge-based economies, it would be advisable for Kazakhstan to begin collecting statistics following the recently updated WIPO guidelines (WIPO, 2015c).

4.7. Royalties and licensing fees

Kazakhstan is a net importer of IP, as is the case of other emerging countries in the region and beyond (Table 4.6). In 2014, the country paid about USD 166 million in royalties and licensing fees and received only USD 1.8 million. Receipts from royalties and licensing fees in Kazakhstan

were much lower than in other emerging countries, both in absolute terms and as a share of payments. This reflects the very low capacity of Kazakhstan to commercialise its technology abroad.

Table 4.6. **Royalties and licensing fee receipts and payments for selected countries, 2014**

Country	Receipts (USD million)	Payments (USD million)	Share of receipts in payments (%)
Belarus	39.0	207.0	18.8
Kazakhstan	**1.8**	**166.0**	**1.1**
Kyrgyzstan	1.4	5.0	28.0
Russian Federation	665.8	8 021.0	8.3
China	676.4	22 614.0	3.0
India	658.7	4 849.0	13.6
Germany	13 797.2	8 122.0	169.9
Japan	36 832.6	20 935.0	175.9
United States	130 361.0	42 124.0	309.5
Europe and Central Asia	135 940.0	199 883.0	68.0
Upper middle-income countries	2 067.0	40 277.0	5.1

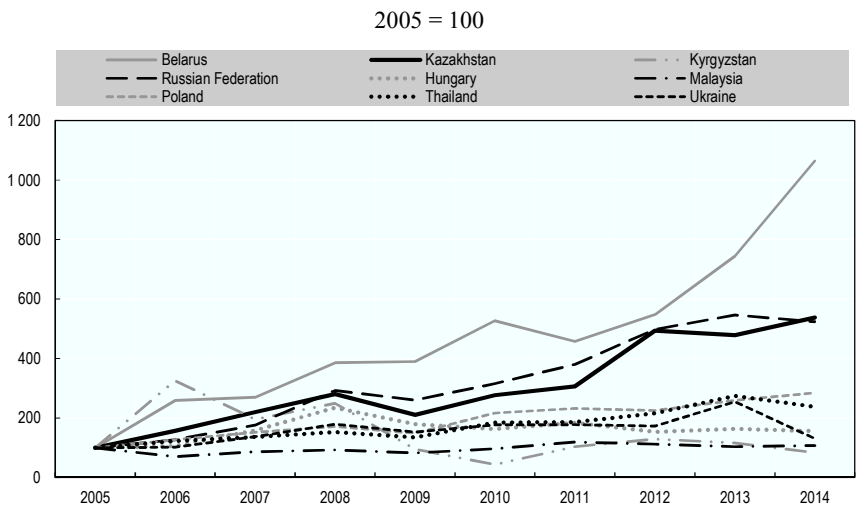
Note: Royalties and licence fees are payments and receipts between residents and non-residents for the use of intangible, non-produced, non-financial assets and proprietary rights, such as patents, copyrights, trademarks, industrial processes and franchises, and for the use of produced originals or prototypes.

Source: World Bank (2016), *World Development Indicators*, http://data.worldbank.org/indicator/BX.GSR.ROYL.CD/countries and http://data.worldbank.org/indicator/BM.GSR.ROYL.CD/countries, based on data from the International Monetary Fund, Balance of Payments Statistics Yearbook and data files.

Since the mid-2000s, royalties and licensing payments have nearly tripled, suggesting that Kazakhstan is tapping more intensively into the international knowledge base. Compared with other countries in the EAEU region, Kazakhstan experienced an increase in royalties and licensing payments smaller than in Belarus and the Russian Federation, but larger than in Kyrgyzstan (Figure 4.8). The growth rate for Kazakhstan's royalties and licensing payments during this period was higher than in Eastern European countries such as Hungary or Poland, and also higher than in other emerging countries in Southeast Asia such as Malaysia or Thailand.

The receipts of royalties and licensing fees by Kazakhstan increased from USD 21 330 in 2005 to USD 1.8 million in 2014. These very low figures are natural given the fact that Kazakhstan is a catching up economy that needs to import foreign technology and is far from becoming a global technology player.

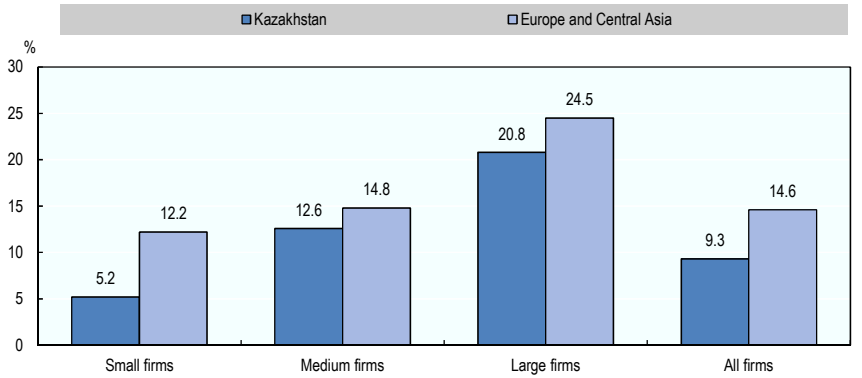
Figure 4.8. **Evolution of royalties and licensing fee payments in Kazakhstan and selected countries**



Source: World Bank (2016), *World Development Indicators*, http://data.worldbank.org/indicator/BM.GSR.ROYL.CD/countries, based on data from the International Monetary Fund, Balance of Payments Statistics Yearbook and data files.

According to the 2013 World Bank Enterprise Surveys (World Bank, 2014), 9.3% of Kazakhstan firms use technology (excluding office software) licensed from a foreign-owned company. That figure is substantially lower than 14.6% among countries in Europe and Central Asia (ECA). This divergence is especially acute in the case of small firms, among which only 5.2% used technology licensed from abroad (Figure 4.9). On the other hand, 20.8% of large firms and 12.6% of medium-sized firms in Kazakhstan licensed foreign technology.

Figure 4.9. **Firms employing technology licensed from a foreign-owned company, Kazakhstan and Europe and Central Asia, 2013**



Notes: Excluding licensing of office software. Small firms are defined as those with fewer than 20 employees; medium-sized firms are those with between 20 and 99 employees; and large firms are those with 100 or more employees. The sample for Europe and Central Asia comprises the following 30 countries: Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, the Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kosovo, Kyrgyzstan, Latvia, Lithuania, Macedonia, Moldova, Mongolia, Montenegro, Poland, Romania, the Russian Federation, Serbia, the Slovak Republic, Slovenia, Tajikistan, Turkey, Ukraine and Uzbekistan.

Source: World Bank (2014), *Enterprise Surveys 2013*, www.enterprisesurveys.org.

Note

1. The copyright industries are defined by WIPO (2014) as those that are dependent on copyright and related rights protection, including music, theatre, opera; motion pictures and video; radio and television; press and literature; photography; software and databases; visual and graphic arts; advertising agencies and services; copyright collecting societies.

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Chapter 5.

Opportunities and challenges of Kazakhstan's intellectual property system for different user groups

This chapter analyses the needs and challenges of four groups of potential and actual users of Kazakhstan's intellectual property system: universities and public research institutes, innovators in traditional and informal sectors, "catching up" businesses such as small and medium-sized enterprises, and the most advanced "frontier" firms, including Kazakhstan's state-owned enterprises as well as multinational companies. The analysis identifies ways that national users can take greater advantage of the intellectual property system and, in so doing, strengthen innovation performance in Kazakhstan.

The opportunities and challenges of using an intellectual property (IP) system for innovation vary considerably among different actors in national innovation systems (OECD, 2014). Any assessment of an IP system and its contributions to innovation must therefore begin by looking at the needs of the different types of actors. Such an analysis has to embrace the diverse types of IP, including patents, trademarks, utility models and geographical indications (GIs). Four types of actors should be considered in the case of Kazakhstan: 1) universities and public research institutes (PRI); 2) informal and traditional sectors; 3) small and medium-sized enterprises (SMEs) and smaller innovators; and 4) the most advanced "frontier" business institutions, including state-owned enterprises (SOEs) and multinational companies.

As is the case with many other emerging countries, Kazakhstan's innovation capacity and use of the IP system is concentrated in universities and PRIs, which account for the largest share of R&D activity (see Chapter 2). In contrast, the innovative capacity of Kazakhstan's business sector is very weak and dominated by SOEs, a situation that needs to change as stronger innovation performance requires the private sector to be at the heart of the activity. The IP system can help enhance the contributions of foreign-owned multinational companies, domestic SMEs, larger businesses and SOEs to improve the country's innovation performance. From a social but also economic perspective, support for inclusive innovation can help ensure the participation of a substantial share of the national labour force in innovation activities, especially in remote areas.

This chapter discusses the opportunities and challenges for each of the groups of potential and actual users of Kazakhstan's intellectual property system.

5.1. Public research institutes and universities

The use of IP by universities and PRIs in Kazakhstan is still at an early stage – yet they are the leading IP user group in the country. Responsible for over 50% of Kazakhstan's gross domestic expenditure in research and development (GERD) (see Chapter 2), universities and public research institutes account for the largest share of patent filings. In 2015, they were responsible for 54% of granted patents, while firms accounted for 24% and individual applicants the remaining 22%.[1] Table 5.1 provides the figures for the top ten patenting institutions. The numbers are very low or zero for most other universities and PRIs.

Similarly to other transition countries, Kazakhstan's universities and public research institutes suffer from a weak tradition of commercialising research (Goldberg et al., 2011; Inzelt, 2015). A very low proportion of research work results in innovations that reach the market (Ibraev, 2015). The total number of resident patent licensing agreements in Kazakhstan was

17 in 2014, 14 in 2013 and 2 in 2012 (NIIP, 2015). Most scientists with aspirations to commercialise the results of their research create spin-off companies. In recent years, roughly around 50 technology-based spin-offs have been established annually. However, these start-ups still rely on substantial public support, as private venture capital is also at a very early stage. According to OECD (forthcoming), universities in Kazakhstan have focused too much on the commercialisation of IP based on patents, licenses and spin-offs, and far too little on other forms of collaborations with industry that often can be much more effective.

Table 5.1. **Top 10 Kazakh institutions by number of patents granted by the national patent office, 2014**

Rank	Name of institution	Number of patents
1	Satpaev Kazakh National Technical University	69
2	Al-Farabi Kazakh National University	33
3	Gumilyov Eurasian National University	31
4	Bekturov Institute for Chemical Sciences	31
5	Asfendiyarov Kazakh National Medical University	13
6	Almaty Institute of Power Engineering and Telecommunications	12
7	Semey State Medical University	10
8	Sokolsky Institute of Organic Catalysis and Electrochemistry	8
9	Kazakh-British Technical University	5
10	National Nuclear Center of Kazakhstan	4

Source: Information provided to the OECD by the National Center for Scientific and Technical Information (NCSTI).

The challenge for commercialisation of public research is influenced by the following weaknesses:

- low quality of research performed at universities
- lack of relevance of university R&D for industry needs
- low demand for technology by the business sector
- excessive bureaucracy and absence of economic incentives at universities
- low managerial and entrepreneurial skills among researchers, including low awareness of IP and industry needs
- poor IP management and lack of funding at various stages of the commercialisation cycle
- a weak business sector incapable of commercialising IP generated by universities

- restrictions constraining researchers' interaction with firms, including lengthy and complex administrative barriers to licensing and to the creation of spin-offs (requiring approval from the Ministry of Education and Science).

5.1.1. The commercialisation support infrastructure

Aside from limited incentives and funding, know-how about obtaining IP is lacking; even more importantly, interactions with industry often are not straightforward. This has led in most countries to the creation of technology transfer offices (TTOs) as intermediate organisations. TTOs specialise in matching the supply of and demand for technology, while co-ordinating different activities of the commercialisation cycle, including invention disclosures; preparing documentation for patent applications; diffusing and exploiting patent policies; developing pilots and prototypes; managing contracts with industry; searching for partners and funding sources; and creating start-ups (Correa and Zuñiga, 2013). Across the world, TTOs are usually entities within universities or research institutes, although some operate in a more decentralised and autonomous manner, as non-profit associations or even as self-sustainable private firms. Some have a specific sector and/or geographic focus. There are also associations of TTOs, some of which are international, that aim to exchange experiences and best practices.

Kazakhstan's universities have only recently set up TTOs. Through a 2011 programme launched by the National Agency for Technological Development (NATD), a total of 21 TTOs have been established in the country's most important universities and public research institutes. These offices tend to be very small units, in most cases with just one or two employees. Support from the NATD was only provided up to 2014; universities now need to finance their TTOs with their own resources. From 2011 to 2014, these offices received 222 applications, of which 56 were selected for proof of concept and of those 27 were selected for further commercialisation (World Bank, 2014). This is an additional indicator of the very small scale of research commercialisation activity in Kazakhstan.

The experts interviewed for this review argued that given the small size and limited resources of existing TTOs, they often tend to focus on dealing with bureaucracy rather than networking with business and doing real commercialisation work. TTO employees often lack the requisite skills for the job as well as sufficient incentive to improve their performance, as they are part of the university structure and do not have to meet clear performance targets. Another challenge concerns the limited capacity of these TTOs to reach global technology markets, given that they lack the necessary international networks and specialised skills.

In addition to those TTOs that have been created within individual universities and public research institutes, in 2013 a nationwide Technology Commercialization Center (TCC) was established as an off-campus TTO, to complement the activity of universities' TTOs. It acts as an overarching institution, providing funding and support to the best projects that it selects from any of the country's universities or research institutes.

5.1.2. Policies to promote the commercialisation of public research

The government of Kazakhstan has engaged in efforts to enhance commercialisation: there are legal reforms under way to better regulate the technology commercialisation process, notably with the new Law on Commercialization of Scientific Activities. The government also offers grants, technical support and training addressed to researchers to promote university-industry collaboration and the commercialisation of public research. Moreover, new science parks and technology transfer offices aim to provide the infrastructure to facilitate commercialisation by enhancing industry-science interaction.

Improving the regulatory framework: The new Law on Commercialization of Scientific Activities

Governments can foster commercialisation by setting clear regulations regarding the ownership of research results and the sharing of revenues from commercialisation as an incentive for researchers. The pioneering reform in this regard, the Bayh-Dole Act, was introduced in 1980 in the United States to create a uniform IP policy among federal research funding agencies; the act enables universities to retain ownership of IP obtained under federally funded research programmes. Over the decades that followed, most OECD countries, and increasingly many emerging countries, adopted similar regulatory frameworks (Paraskevopoulou, 2013).

Until recently, Kazakhstan lacked consistent regulation nationwide on technology commercialisation, leading to lack of clarity as to the ownership conditions and rewards for research results (Box 5.1). In most cases, institutions did not have rights over inventions and there were no clearly established criteria for rewarding others.

The new Law on Commercialization of Scientific Activities that was approved in October 2015 promises to bring a number of important changes. The law was drafted by the Ministry of Science and Education, with support from both a working group comprising representatives of the different stakeholders and from the World Bank. The law first outlines its four guiding principles, clearly based on the principle underlying the Bayh-Dole Act of providing adequate incentives for commercialisation:

- providing more transparency in the interaction of all participants in the process of commercialisation
- guaranteeing the rights and interests of researchers involved in the invention process, in particular their rights over income generated from the inventions
- providing economic incentives for the commercialisation of scientific activities in the priority sectors of the economy
- increasing the integration of education, science, industry and institutions engaged in innovative development.

Box 5.1. **The intellectual property commercialisation practices of Kazakhstan's universities prior to implementation of the Law on Commercialization: Three cases**

Gumilyov Eurasian National University's "2020 Development Strategy" (2012) was set as one of the strategic objectives to foster the commercialisation of technology. The strategy's goal is for 50% of the university's research centres to have commercialised some research results by 2020. A small Department of Technology Commercialization with a staff of five was created in 2014 to assist researchers in the process of obtaining intellectual property (IP) as well as to establish stronger industry linkages. Recently the department surveyed a large number of firms to map their technological needs and match them with researchers' capacities, collecting a total of 500 entries for which the university's researchers are searching for solutions. A new innovation park and a better-resourced engineering laboratory also number among the measures to facilitate technology commercialisation.

The university offers a small bonus to researchers who obtain IP rights, but the IP itself is not a criterion either in the selection or in the promotion of academic staff. As of August 2015 the university had ownership of any invention created by its employees or students, and so far there are not any provisions for researchers to obtain any income if the patent is commercialised. As a reward, inventors of commercially successful technologies get additional resources for equipment, research assistants, etc. The new Law on Commercialization may well change the situation.

Box 5.1. **The intellectual property commercialisation practices of Kazakhstan's universities prior to implementation of the Law on Commercialization: Three cases** (*continued*)

The Kazakh Agro Technical University has a patent division, with two employees who assist university researchers in patenting their inventions (e.g. preparing the documentation to submit before the patent office); it also organises training for staff and students on IP-related matters. Most of the IP rights held by the university are in the area of agricultural biotechnology, agricultural machinery, cattle breeding, and plant and seed growth. The university has had one staff member in charge of supporting researchers' efforts to establish links with industry since 2011.

University regulations stipulate that the university is the owner of the IP generated by its employees. The distribution of royalties and income from patent licensing between the university and the inventor is decided on a case-by-case basis. The university provides a small bonus to employees who are granted patents.

Nazarbayev University has a dedicated Vice President for innovation, who oversees a specialised office for technology commercialisation. In 2013, the management council of the university approved an "Intellectual Property Policy", a revised version of which was approved in 2015. This document provides clear rules regarding the rights and obligations of the university, the authors of IP, and the industrial partners. An IP Committee was established under the University's Research Council, and given the role of providing oversight of technology transfer activities and ensuring implementation of the Intellectual Property Policy. In addition, an Office of Commercialization was created and given the following duties: 1) processing, negotiating and managing licensing agreements; 2) determining the patentability and evaluating the commercial potential of researchers' outputs; 3) securing IP protection; and 4) finding suitable commercialisation partners. The university has also developed training programmes on IP for its researchers and is integrating training on IP and entrepreneurship within most of its academic programmes.

The university's IP policy stipulates that IP produced by employees or students is owned by the university, while any royalties, equity or income generated from the commercialisation of the technology is shared with the author. In particular, the author receives 100% of the first USD 80 000 of income generated; 75% of income from USD 80 000 to USD 200 000; and 50% of any income generated that is above USD 200 000.

Source: Interviews and information provided by representatives of Nazarbayev University, Gumilyov Eurasian National University and Kazakh Agro Technical University.

Four decisions regarding ownership of research, rewards to inventors and support infrastructures promise to improve the framework for commercialisation. First, the law stipulates that IP rights resulting from publicly funded research belong to the scientific institutions where the research was conducted, unless a contract between the institution and the inventors states otherwise. Universities and research institutes hold exclusive rights on the IP generated by their employees, including to license or sell the IP. Universities and research institutes are also entitled to be founders of start-up companies to exploit the technology. The law mentions that universities and researchers can participate in the capital of such start-ups with shares that are equivalent to the value of the IP they provide. Thus, universities are provided with more autonomy to commercialise research, and are no longer subject to approval processes from the Ministry of Education and Science.

Second, the law equally provides incentives for innovators by determining a minimum amount of payment to be received by the inventor. If the exclusive rights to the IP belong to the scientific institutions where the research was conducted, the inventors should receive a one-off payment equivalent to at least one average monthly salary, regardless of whether it is commercialised or not. If a licence agreement or a contract to assign exclusive rights of the IP is concluded between the institution and a third party, the inventors should be paid at least 30% of the income generated. The provision will require finding adequate arrangements to deal with requests from researchers/inventors for payments that are well above the IP's market value, which is difficult to adequately assess (see Chapter 6).

Third, the law establishes a minimum amount that universities and research institutes should allocate to the funding of their technology transfer offices. TTOs should be financed with at least 2% of the R&D grants received by the university and not less than 10% of the income accrued from licence agreements or contracts of assignment of IP rights. While support services are doubtless critical to facilitate commercialisation, creating high-quality TTOs within each institution may prove challenging. A more sustainable model for commercialisation support would involve providing cross-institutional support services (see the discussion below on TTOs).

Fourth, the law mentions that the state shall provide additional incentives to those universities and research institutes involved in the commercialisation of technology. These could, for example, take the form of specific grants for commercialisation; co-financing for new start-ups engaged in high-tech production and/or to introduce new technologies; and training programmes for those involved in the technology commercialisation process.

To ensure that the Law on Commercialization of Scientific Activities is successful in strengthening science-industry linkages, it will be critical to:

- Support implementation of the law and create awareness about the opportunities it provides among stakeholders. It will be critical to provide technical support to facilitate the implementation in the country's universities and PRIs. The new law also needs to be accompanied by awareness-building campaigns targeted at university managers and researchers, with a focus on the opportunities it provides. It is important to inform researchers of how they can benefit from becoming involved in technology commercialisation, and to provide them with institutional guarantees as to how they will participate in the gains.

- Provide guidelines and model contracts covering different options for IP commercialisation and collaborative projects. Guidelines setting forth different options to establish science-industry relations and distribute rights between inventors and owners of IP should be provided for all universities and public research institutes, as the lack of clear provisions may undermine uptake. Ireland furnishes an interesting learning model. Since 2014, Knowledge Transfer Ireland, a partnership between Enterprise Ireland and the Irish Universities Association, provides an online platform with practical guides and model agreements to facilitate the process of licensing agreements between research and industry.[2] Regarding collaborations in Kazakhstan, which may become more important in the coming years, the so-called Lambert toolkit developed by the UK Intellectual Property Office comprises a set of guidelines and model contracts addressed to universities and companies wishing to undertake collaborative research projects with each other. A recent evaluation found that providing these model contracts indeed facilitated collaborations.[3] The guidelines and handbook for promoting university-business links developed in the European context under the "Responsible Partnering Initiative and University-Business Collaborative Research", by the European University Association and other partners could also be useful.[4]

- Develop guidelines for assessing the value of IP and determining fair prices for accounting valuation purposes and for market transactions. The Danish Patent and Trademark Office, for example, has developed a comprehensive web portal that provides useful guidelines for IP valuation.[5] (Chapter 6 discusses methods available for IP valuation further.)

- Provide effective incentives for researchers to collaborate with industry. The incentives provided in the law do not play a role in researchers' careers. To promote technology commercialisation, it would be advisable to introduce new measures to reward researchers' career opportunities for building linkages with industry, to mobilise research funds from private sources and participate in spin-offs.
- Allow for researcher mobility to engage in spin-offs. The law is silent about the compatibility of research careers and engagement with industry. This relates notably to flexibilities in research contracts. In view of fostering relations, in Brazil the 2004 Innovation Law encourages the public and private sectors to share staff, funding and facilities such as laboratories. Researchers are allowed to work in other institutions to conduct joint projects, and can request special leave if they decide to become involved with a spin-off company (Correa and Zuñiga, 2013). Another option relates to providing sabbaticals for temporary mobility. For example, in Malaysia researchers are allowed to take a sabbatical if they want to engage in spin-off companies (OECD, 2015).

Provision of grants, technical support and training

The Technology Commercialization Center (TCC) and the National Agency for Technological Development (NATD) both offer grants for universities and research institutions. The TCC offers two types of grants to scientists willing to commercialise their research results: 1) grants for development of proof of concept, i.e. development of technical documentation, certification, etc., of up to USD 243 000 (Kazakhstani tenge [KZT] 22 million); and 2) grants for development of an industrial prototype, i.e. for the start of an industrial pilot or small-scale production, of up to USD 814 000 (KZT 74 million) (Box 5.2).

Meanwhile, as of 2016, the NATD has offered a grant of up USD 2.2 million (KZT 200 million) for technology commercialisation.[6] This grant is open to entrepreneurs and researchers at universities or at public research institutes. Thus a researcher can apply for (and eventually obtain) a grant for the same project from both the TCC and the NATD. The overlap in support and risk of possible double funding has led to further collaboration between the centre and the agency: currently a member of the NATD sits on the evaluation panel of the TCC's grants, and vice versa. Looking forward, it would be advisable for the NATD and the TCC to strengthen co-operation by establishing a joint programme to promote the commercialisation of research results.

Box 5.2. **The Technology Commercialization Center**

The Technology Commercialization Center (TCC) started operating in 2013 within the Ministry of Education and Science, as part of the Technology Commercialization Project co-financed by the World Bank. By December 2015, the TCC had awarded 33 grants for technology commercialisation selected from 785 applications, across 4 different technology areas: 1) live sciences; 2) rational use of natural resources, recycling of raw materials and products; 3) energy and mechanical engineering; and 4) information and communication technologies. These projects have received financial support and complementary services, including coaching, training and joint marketing of identified technologies at international technology fairs. To date, a total of 17 patents have been registered with the support of the TCC, and other patent projects are at an advanced preparation stage. Two technology licence contracts have been concluded with the intermediation of the TCC in the course of the project.

Besides these technology commercialisation grants provided through the TCC, another component of the Technology Commercialization Project involves a grant launched in 2011 for senior and junior research groups; the grant is also operated by the Ministry of Education and Science. Although this grant is not strictly focused on technology commercialisation, one of the main criteria for evaluating research projects is the potential for commercialisation. A total of 33 grants have been awarded under this programme out of 726 applications (TCC, 2015). Grants for senior research groups can reach USD 500 000 per year over a period of three years, while those for junior research groups are limited to USD 300 000 per year, also over three years. This programme contributed to institutional reform by demonstrating the advantages of competitive, merit-based, peer review systems, and by considering more explicitly the projects' alignment with market needs. It provided an example of good practice that influenced other R&D funding agencies in the country.

Sources: Alliance of Technology Commercialization Professionals (n.d.), Alliance of Technology Commercialization Professionals website, http://atcp.kz (accessed 30 May 2016); World Bank (2015), *Implementation Status and Results, Kazakhstan*; TCC (2015), *Innovative Projects Catalogue*; and interviews with the management of TCC.

Training, awareness-raising campaigns and more targeted support services are also offered. The National Institute of Intellectual Property (NIIP) organises courses and seminars on technology commercialisation addressed to scientists. In addition, the National Center for Scientific and Technical Information (NCSTI) sets up training and networking events to bring together scientists and investors. It also provides advice to scientists on the patentability of R&D outputs. Finally, TCC provides training and coaching services for researchers and entrepreneurs, and organises the promotion activities of Kazakh technologies in international markets. The TCC has to date trained a total of 460 scientists and entrepreneurs in the

commercialisation of research (World Bank, 2015). It provided a total of 16 training workshops across the country's different regions in 2014.

Policies regarding technology transfer offices

Creating self-sustainable TTOs in institutions that have only just started to reach out to industry is challenging. Ideally, TTOs should reach financial autonomy through participation in revenue generated from the technologies they commercialise and through income from consulting services. However, Kazakhstan is still at an early stage of developing its technology transfer system, so such objectives cannot really be a priority. International experience suggests that deployment of TTOs requires long-term financial support and commitment by policy makers over a horizon of at least ten years before they can be left to operate on their own resources (Correa and Zuñiga, 2013).

However, creating high-quality TTOs at each public research institution will be challenging, and efforts are better invested in creating associative TTOs that cater to various institutions; even there however, challenges may arise (Box 5.3). In contrast to universities' TTOs, the Technology Commercialization Center (TCC) can reach international markets. It could be useful to create a national association of TTOs[7] to focus on sharing good practices and developing joint training activities, while linking with international associations of technology transfer professionals (such as the Association of University Technology Managers or the European Technology Transfer Offices Circle). The experience of the TCC can prove useful in the process of building such an institution. Along these lines, one of the new initiatives contemplated in the Fostering Productive Innovation Project launched in 2016 with the World Bank is to develop an association of Kazakh TTOs to support capacity building at individual existing TTOs. Moreover, the creation of an association of TTOs from the member countries of the Eurasian Patent Organisation would be interesting to explore, as would building linkages with international associations of TTOs.

Box 5.3. **Associative technology transfer offices: Recent experiences in Chile and Colombia**

In recent years, many emerging countries have created associative technology transfer offices (TTOs) that bring together several universities. The objective has been to reach sufficient critical mass to operate more efficient and higher quality specialist services. The case studies from Chile and Colombia presented here illustrate different approaches to building economies of scale through the association of universities and research institutes to establish new intermediary institutions.

Box 5.3. **Associative technology transfer offices: Recent experiences in Chile and Colombia** (*continued*)

In **Chile**, a new TTO called OTRI Chile was created in 2005 through a partnership of five universities and two business associations. At that time, the participating universities did not have their own TTOs, and OTRI Chile was envisioned as a solution to attain sufficient critical mass to provide professional services and to establish linkages with not only national but also international technology markets. Despite some promising results in its first years of operation, OTRI Chile was progressively downsized as financial and operational challenges arose, and eventually it ceased operating. The main problems it faced were related to the lack of interesting projects that could reach the commercialisation stage, and difficulties of co-ordination among participating universities.

Since then, the government of Chile, through its national innovation agency Corfo, has focused on supporting the development of TTOs at individual universities. More recently, Corfo has initiated a new programme to form "hubs of technology transfer", i.e. associations of universities' TTOs focusing on specific priority sectors. The programme is still at a very early stage; the first call for proposals was launched in October 2015 and ran through December 2015. The aim of these hubs will be to increase the scale and international scope of commercialisation of research performed at Chilean universities and research institutes. Corfo provides grants to cover up to 80% of the hubs' costs over a five-year period, with a limit of around USD 7.3 million per hub. These hubs are to be established as independent, decentralised entities whose shareholders are a group of at least six universities and/or public research institutes. The hubs will coexist with the individual TTOs of participating universities, but will focus on the international commercialisation of technologies and on three priority sectors (agriculture, health, and industrial production and energy).

In **Colombia**, Tecnnova was created in 2007 as a non-profit organisation by the main universities of the region of Antioquia. The aim was to overcome the constraints of existing TTOs at universities, which often lacked the human resources, expertise and experience necessary to undertake their work effectively. Tecnnova aims to reach economies of scale in order to be able to provide advanced technology transfer services and commercialisation support to research groups. This support includes market intelligence services, pilot testing, patent management, industrial partner search, licensing strategies and other technology commercialisation services. Tecnnova does not replace universities' TTOs but rather complements them with more professional services, and provides training and advice to existing TTOs.

Today, the partners of Tecnnova comprise 12 universities, and the organisation has expanded beyond the region of Antioquia by including 2 universities from other Colombian regions. The key challenge for Tecnnova now is to ensure its sustainability. Currently, 60% of its annual income comes from consulting services, while the remaining 40% is obtained from competitive public funding from the national and regional governments. The member universities provided funds in 2008 for the constitution of Tecnnova, but no longer contribute to its annual budget.

Sources: Interviews with managers of CORFO and Tecnnova; www.corfo.cl; www.tecnnova.org.

It would also be advisable to provide sectoral commercialisation services processes with specialised staff who have sectoral experience and networks to facilitate successful commercialisation. In the short term, efforts to build sectoral expertise could take the form of specialised committees, bringing together representatives from universities, public research institutes (PRIs), firms and other experts in addition to in-house staff. Agriculture and mining are two candidate sectors given Kazakhstan's competitive advantage in those activities. The technology commercialisation office of KazAgroInnovation could play a leading role in supporting efforts with regard to developing agriculture support services. In the longer run, specialised associative TTOs can be of interest.[8] A good example in this respect is the Chilean Hubs of Technology Transfer programme, which was launched in 2015 and created autonomous technology transfer offices in three strategic sectors (agriculture, health, and industrial production and energy), through the association of at least six universities and PRIs (Box 5.3).

Science parks and virtual platforms

To promote university-industry linkages and foster technology commercialisation, the government has developed several science parks and business incubators. Since 2004, the NATD has created eight science and technology parks in various regions of the country (Table 5.2). The older ones were created through an NATD programme, initiated in 2004, that developed regional science parks. Such parks often lacked sufficient critical mass and have been criticised in the past, both for their focus on generic business incubation and for their limited success in fostering technological innovation (e.g. see Radosevic and Myrzakhmet, 2009).

Table 5.2. **Main science and technology parks in Kazakhstan**

Name	City	Year of establishment
Algoritm Technopark	Uralsk	2004
Sary-Arka Technopark	Karaganda	2004
Technopark of KazNTY	Almaty	2004
Almaty Regional Technopark	Almaty	2005
Astana Regional Technopark	Astana	2005
South Kazakhstan Regional Technopark	Shymkent	2008
Altay Regional Technopark	Ust-kamenogorsk	2008
Alatau Park of Innovative Technologies	Almaty	2005
Astana Business Campus	Astana	2015

Sources: NATD (2015), *Innovation System of the Republic of Kazakhstan*; Nazarbayev University.

More recently, the government has opted for concentrating resources to develop two more ambitious science parks with a national scope: the Astana Business Campus and the Alatau Park of Innovative Technologies. The Astana Business Campus, located within the premises of Nazarbayev University, started operating in 2015 (Box 5.4). The Alatau Park was created in 2005 near Almaty through the initial NATD programme, but has expanded substantially since 2011 with additional funding. It focuses on ICT and nanotechnologies, and has already attracted over 150 companies, including foreign multinationals such as Microsoft, IBM and Intel.

Box 5.4. **The Astana Business Park at Nazarbayev University**

A new science park called the Astana Business Campus opened in a 0.5 km^2 plot of land adjacent to Nazarbayev University in 2015. The campus is being developed with the support and advice of the High Tech Business Campus Eindhoven, a Dutch science park. Nazarbayev University has also signed memoranda of co-operation with several foreign companies that have agreed to locate in the Astana Business Campus, such as Philips, Intel and Huawei. There are other negotiations under way with companies such as Cisco and IBM. The Samruk-Kazyna sovereign wealth fund, which groups together most of the state-owned enterprises across different industries, is planning to establish its main corporate research centre on the campus. The International Scientific and Technological Centre (ISTC) has also relocated from Moscow to the Astana Business Campus. The ISTC is an intergovernmental organisation established in 1992 by an agreement among the European Union, Japan, the Russian Federation and the United States. It serves as a clearinghouse for developing and financing research projects aimed at engaging weapons scientists, technicians and engineers from the Commonwealth of Independent States (CIS) in peaceful, civilian science and technology activities.

Sources: Interview with representatives of Nazarbayev University; http://nu.edu.kz.

Aside from science parks, virtual platforms can facilitate the diffusion of the results of public research to relevant industry partners and consequently increase uptake. Kazakhstan has engaged in initial efforts, and further efforts should prove fruitful (see Chapter 6).

5.2. Traditional and informal sectors

5.2.1. Support for inclusive innovations in Kazakhstan

New approaches to innovation policy help link innovation and technological progress not only with the productivity agenda but also with social objectives, as these take into account the needs of disadvantaged

communities and of the lagging regions in Kazakhstan (Paunov, 2013). While the national intellectual property system is not the principal tool for supporting these types of innovations, it can contribute to creating opportunities for innovators.

Social entrepreneurship has received greater policy support in Kazakhstan in recent years.[9] For example, since 2008 the "Fund of the President of the Republic of Kazakhstan" organises an annual "Fair of Social Projects". The fund has also financed the implementation of 198 innovative projects to support people with disabilities, health and educational charity shelters, centres for the support of libraries, children and youth organisations, centres of social adaptation for women and children, family support centres, etc. Moreover, the National Chamber of Entrepreneurs created the "Social Innovation" Fund to support entrepreneurial projects with strong social content.

In addition, the aforementioned Fostering Productive Innovation Project, the follow-up project of the World Bank's Technology Commercialization Project (2010-15), has a USD 35 million fund for 2016-21 to support "inclusive innovation consortia". These are public-private partnerships that develop innovations in the fields of health, education, water, and urban and rural infrastructure to address social needs (World Bank, 2014). The projects will likely raise further awareness of the importance of inclusive innovation and of fostering closer collaboration among relevant ministries (e.g. those concerned with health and infrastructure) in innovation projects of this nature in Kazakhstan.

5.2.2. The use of intellectual property in agriculture

Agriculture is an important traditional sector in Kazakhstan, and rising global demand for food products represents an opportunity for the country to increase agricultural exports and exploitation of its vast mass of unexploited land. To embrace this opportunity, it would be important to engage in investments and reforms (Box 5.5). R&D and innovation investments as well as technology extension services can contribute to improving the development of agriculture in Kazakhstan.[10]

Kazakhstan's public holding KazAgroInnovation concentrates most of the country's research capacities in agriculture and livestock. Established in 2007, KazAgroInnovation groups together most of the country's public research institutes in this field. Currently, one of its most promising areas of research is related to new technologies for grain drying and grain storage. KazAgroInnovation has recently patented an automated grain drying system, which is being deployed widely. It also holds over 40 patents for micro-organisms.

Box 5.5. **Improving the performance of Kazakhstan's agriculture sector**

A review of Kazakhstan's agricultural policies by the OECD (2013) made the following recommendations:

- Refocus policy efforts on strategic investments such as transport infrastructure, agricultural research and innovation, food safety systems, and training. The local transportation network, which is critical in the supply chain from farm to market, continues to require major improvements. The agriculture sector would also benefit from increased efforts to adapt technologies developed abroad to local conditions, complemented by local R&D activities to address Kazakhstan's specific needs. Another priority is to invest in training to address the acute shortage of qualified labour. Finally, modern phytosanitary, veterinary and food safety systems still need to be fully deployed.
- Increase efforts to integrate small-scale producers into agricultural markets and to diversify and improve rural incomes. Alongside large agricultural firms, there are over 2 million rural households that farm small plots mainly for subsistence. Individual farms and household plots represent over two-thirds of total agricultural output. More efforts are necessary to encourage small farmers to adopt new technologies in order to improve productivity.
- Adopt a broader vision of food security through a diversified policy approach that focuses on environmentally sustainable productivity growth, rural development, poverty reduction and trade openness. The 2005 Agricultural Law included the objective of sustainable development of agriculture and the improvement of living conditions in rural territories. Further action is necessary to fulfil these objectives, as the agriculture sector suffers from water shortages and a harsh climate.

Source: OECD (2013), *OECD Review of Agricultural Policies: Kazakhstan 2013*, http://dx.doi.org/10.1787/9789264191761-en.

To promote commercialisation of its IP, in 2009 KazAgroInnovation created the AgroTechnology Transfer and Commercialization Center. Its role is to gather information on all patents and new technologies developed by KazAgroInnovation's research centres and disseminate the information throughout the country's different regions. It aims to promote the commercialisation of technologies developed in KazAgroInnovation's research institutes, both domestically and abroad. KazAgroInnovation also operates several regional centres for knowledge dissemination and 15 testing farms that allow the testing of new seeds and demonstrate to farmers how new technologies and methods work in practice.

During this transformation process, it would be interesting to learn from successful international experiences – such as Embrapa in Brazil, which showcases the importance of informal interactions for technology transfer (Box 5.6).

Box 5.6. **The case of Embrapa**

Embrapa is a public agricultural research corporation under the aegis of the Brazilian Ministry of Agriculture, Livestock and Food Supply. It focuses on developing new technology and promoting its adoption to advance the sustainable development of agriculture in Brazil. To achieve its goals it has developed an efficient and inclusive technology transfer model to reach peripheral rural communities. This model included informal training and close interpersonal interactions with farmers (Fugisawa Souza et al., 2015).

In recent decades, Embrapa has contributed to transforming Brazil into one of the world's largest food producers and exporters. Embrapa has incorporated a wide area of formerly degraded or unproductive land in the Cerrado region into the system, which now represents nearly 50% of the country's grain production. This could be an interesting learning model for Kazakhstan in view of the availability of large areas of unexploited land. Embrapa has also contributed substantially to modernising and expanding Brazil's production of beef, pork and chicken – another area with strong potential in Kazakhstan.

Sources: www.embrapa.br/en; Fugisawa Souza et al., M.I. (2015), "Non-formal education for technology transfer in Embrapa: Microlearning, microtraining and microcontent by mobile devices", https://library.iated.org/view/FUGISAWASOUZA2015NON.

The IP system could also contribute to increasing the perceived quality of local production through an improved use of trademarks to brand the quality of food products. Use of trademarks can allow food producers to receive rewards for investing in higher quality products, allowing for an innovation culture in agriculture. With increased consumer awareness of food quality, such efforts are also likely to heighten the export potential of agricultural produce. At this point Kazakhstan is only embarking on efforts in this regard. To date, as discussed in Chapter 4, it has created five geographical indications (GIs): two on mineral waters (Saryagash and Akzhayik), a dairy product (Rudny Tan), a traditional food specialty (Kezhe Rudny) and a ground water hydrology service (Akzhayik).

In addition, it is critical to embrace new initiatives to promote the adoption by farmers of improved food safety standards and certifications (OECD, 2013). There is also wide scope for upgrading existing agricultural products through new certifications, standards and GIs linked to ecological, organic and "fair trade" food products. "Fair trade" food products are becoming increasingly important in many export markets, where upper- and middle-class consumers are willing to pay higher prices to obtain such products.

5.2.3. Intellectual property for traditional handicrafts and textiles

Kazakhstan has several traditional industries that to date have been little exploited for business opportunities. Examples include jewellery, embroidered cloths, carpets and traditional dresses. Traditional handicrafts and textiles also have strong potential for cross-fertilisation with an emerging tourist industry.

The "Development of Crafts and the Revival of Folk Arts and Crafts in Kazakhstan" programme supports Kazakh artisans' products domestically and internationally. This programme, in place since 2006, is conducted by the Union of Artisans of Kazakhstan, Chevron, the Eurasia Foundation of Central Asia, the Kazakh Ministry of Culture and Information, and the UNESCO Cluster Office in Almaty. Its main promotion activity consists in organising an annual contest (the Sheber contest) to search for the most talented and promising artisans, and to raise awareness among the general public about the achievements and capacities of domestic producers of handicrafts.

In order to expand the markets for traditional Kazakh products, it would be advisable to foster stronger co-operation among existing producers, including joint marketing and promotion, websites and e-commerce platforms. To that end, it could be useful to promote the development and use of collective quality brands. These can be a powerful tool for local development, as they contribute to forging a common strategy and a set of shared product standards and criteria. Often it is illusory to expect local producers to have sufficient know-how or resources to engage in product quality improvements and marketing activities needed to effectively succeed in selling products.

The recent success of Uzbekistan in promoting traditional textiles from its regions demonstrates that success is possible. Uzbekistan shares with Kazakhstan a rich tradition of silk textiles, a legacy of their involvement in the ancient Silk Road. Uzbek *ikat* and *suzani*, fabrics typically embroidered with silk threads, have become national emblems (Mentges and Shamukhitdinova, 2013). In Uzbekistan, these ancient textile techniques and designs are used in a new textiles industry that employs new technologies and modern business practices. In addition, Uzbek textiles have had some success in international fashion markets, as leading fashion houses such as Balenciaga, Etro, Issey Miyake, Oscar de la Renta and Valentino, among others, have drawn on Uzbek designs in their collections (Gibson, 2015).

5.2.4. Intellectual property for traditional knowledge, genetic resources and traditional cultural expressions

Traditional knowledge, genetic resources and traditional cultural expressions also have importance for Kazakhstan. The country is endowed with a great diversity of natural conditions, ecosystems and species, including over 6 000 species of higher vascular plants, 5 000 species of mushrooms,

485 species of lichens, 2 000 species of seaweed, 178 mammal species, 489 bird species, 12 amphibian species and 104 fish species. In addition, the Chu-Iliski mountains contain the oldest fossils (dating back 420 million years) discovered on earth. Traditional knowledge and cultural expressions are related to the country's traditional nomadic pastoral economy, including the yurt[11] and the use of sheep, horses and camels for transportation, clothing and food.[12]

Efforts to protect and promote business models based on traditional knowledge, genetic resources and traditional cultural expressions can bring further benefits to local communities across Kazakhstan's regions. Regarding protection, Kazakhstan is signatory to the Convention on Biological Diversity (CBD) since 1994 (CBD, 2014). The work on implementing and monitoring progress in relation to the CBD is supervised by the Ministry of Environment and Water Resources of Kazakhstan. Kazakhstan joined the UNESCO Convention for the Safeguarding of Intangible Cultural Heritage in 2011, which creates the basis for effective protection, dissemination and development of the country's intangible cultural heritage.[13] The creation of an international legal framework to protect traditional knowledge, genetic resources and traditional cultural expressions has gained increased attention in recent years from the international community (OECD, 2014).

Beyond protecting these assets through IP for cultural and social purposes, the potential associated business opportunities should be explored in order to bring new economic benefits to local communities. Most policy efforts to date have concentrated on supporting the preservation of Kazakh history, customs and traditions of different ethnic groups rather than exploring possible opportunities for developing businesses on their basis.

5.3. "Catching-up" businesses: Small and medium-sized enterprises and young companies

5.3.1. Intellectual property use among small and medium-sized enterprises

The contribution of SMEs to the Kazakh economy is very low by international standards.[14] According to data from Kazakhstan's Committee on Statistics, in 2014 there was a total of 926 840 active SMEs employing 2.8 million people, which represented 26.3% of GDP and 33% of employment in the country. The wholesale and retail sector accounted for 42% of SMEs, followed by the agriculture sector with around 17%. Less than 3% of SMEs were involved in manufacturing (Committee on Statistics, 2016).

Kazakhstan's SMEs hardly use patents or other forms of IP rights, as SMEs generally lack capacities to develop and adopt advanced technologies. This goes hand in hand with low awareness of IP among SMEs. While

SMEs internationally are generally less engaged in IP use, the low uptake in Kazakhstan is particularly striking, although it can be explained by the multiple structural challenges SMEs face. According to a 2013 Asian Development Bank survey of 1 600 SMEs, the main challenges are the low skills of entrepreneurs, the lack of financial support, corruption and excessive red tape (ADB, 2014b) (see also Chapter 2).

Promoting the use of IP by SMEs will require embracing trademarks, design rights and utility models. Most SMEs in Kazakhstan operate either in the services or in the agriculture sectors, which are less prone to patenting. Other types of IP, including notably trademarks, may be more relevant to them. Utility models may also be relevant as a way to help SMEs gain experience with IP, even if research capacities do not yet permit obtaining patents. In recent years, a new generation of technology-based start-ups is slowly emerging, based on the commercialisation of patents developed at universities and public research institutes. This might help progressively change the trends described above.

5.3.2. Policies supporting SMEs' use of intellectual property

To encourage the use of IP by SMEs, in 2014 the National Institute of Intellectual Property (NIIP) introduced a 20% discount on IP registration fees applicable to SMEs. It would be interesting in the future to determine whether it is worth maintaining (or even expanding) this incentive. Other factors may be more important constraints than the funding required to obtain IP.

Since 2013, the NATD offers a grant for the commercialisation of IP targeted to firms and entrepreneurs. The grant can reach up to USD 330 000 (KZT 30 million) per project, including the development of proof of concept and of industrial prototypes. This has contributed to the emergence of several successful start-up companies based on the commercialisation of IP developed by researchers from universities and public research institutes. In addition, the NATD runs the Technological Business Incubation programme initiated in 2010, which aims to support innovative projects through grants for developing business plans, conducting marketing research, developing prototypes and launching production of these innovative products. Such support extends to IP issues when deemed necessary.

But overall, government support has focused primarily on promoting IP from public research, due to a strong focus on patenting. Since promoting a stronger uptake of IP by established firms is equally important, providing support to firms for using other forms of IP such as trademarks on a case-by-case basis would be relevant. Likewise, it would be useful to offer guidance and support to SMEs interested in franchising, since franchises can

facilitate the international transfer of non-technological knowledge, including modern business practices and tacit know-how. While not at the frontier of innovation, this could be a stepping stone for developing IP more broadly, since franchises often combine the licensing of trademarks and patents.

A growing number of free training schemes related to IP have been offered to entrepreneurs and SMEs in recent years through the NIIP, the NATD, the Damu programme and the TCC. These tend to be generic training initiatives covering the basics of IP through short seminars. Another requirement for building an IP culture is to ensure that SMEs are aware of the importance of complying with IP regulations, working together with trade associations and organisations to support efforts to protect IP and stop counterfeiting. The Chambers of Commerce and the Kazakhstan Association for Copyright and Related Rights' Protection (KAZASP) could be useful in this endeavour.

In addition to general awareness campaigns, it would be relevant to also provide some targeted support to businesses, helping them to identify their use and potential for registering IP in view of their business strategy. An interesting example along these lines is the "Propiedad Intelectual Colombia" (2010-14) project financed by the Inter-American Development Bank and by the Colombian Chambers of Commerce (OECD, 2014). This project provided direct consulting services to more than 400 micro, small and medium-sized firms in different regions of the country. Evaluation of the programme found that most firms experienced increases in revenue and in the value of their trademarks.

As part of its effort to inculcate an innovation and IP culture in the country, since 2003 the government has been sponsoring the "Shapagat" annual competition for inventors, including nominations for the "Invention of the Year", "Most Active Inventor", "Young Talent" and "Woman Inventor". It would be interesting to consider expanding this competition by including a new prize category for innovative SMEs actively using intellectual property, such as, for instance, for the best trademark. In addition, it would be advisable to integrate an appraisal of the commercialisation potential of inventions into the selection criteria. Moreover, prizes in this competition should not be limited to one-off recognition, but also include follow-up support and services to promote the commercialisation of inventions and the eventual creation of new business opportunities and jobs.

Technology transfer from overseas through the exploitation of patents and licences is a key part of Kazakhstan's catch-up strategy, and should extend further to include not only large firms but also SMEs. In 2013, the NATD began offering a grant for technology transfer, targeted to local firms that license a patent from abroad; the grant covers up to 50% of the cost, up

to a maximum of USD 1 651 000 (KZT 150 million). To help match local technology demands with available foreign technologies, the NATD is also directly involved in technology foresight, screening, selection and adoption activities. For this purpose, since 2010 the NATD has created five small international technology transfer centres, in co-operation with foreign partners in the People's Republic of China (hereafter "China"), France, Korea, the Russian Federation and the United States. The services provided by these centres include dissemination of information; seeking of foreign investors, partners and technologies; initiation and co-ordination of joint projects; and organisation of joint training programmes and staff development co-operation.

Efforts to link with foreign sources of knowledge through different formal and informal channels will need to be expanded in the future. Along these lines, the Fostering Productive Innovation Project that started in 2016 with funding from the World Bank plans to establish new "technology acceleration offices" outside Kazakhstan. These would support Kazakh technology companies by providing information on foreign markets and technology trends, while facilitating interaction with foreign institutions to foster the commercialisation of Kazakh technologies.

5.4. Leading "frontier" businesses

5.4.1. Intellectual property use among leading national firms

Many leading national firms in Kazakhstan are state-owned enterprises (SOEs), controlled by the sovereign wealth fund Samruk-Kazyna. Traditionally, SOEs have based their technological strategies on importing ready-to-use equipment and technologies, while in-house R&D activities and contracts with local research centres remain infrequent. As a result, these SOEs have developed few new technologies and hold very few patents. However, there are some exceptions, notably in the mining sector (Box 5.7).

Box 5.7. **Expanding Kazakhstan's technological capacities in the mining and energy sectors**

The mining sector of Kazakhstan is dominated by a few large state-owned enterprises (SOEs) and foreign investors, which have relied mainly on technology imported from abroad. However, some SOEs have developed promising technologies with potential for commercialisation in the country and overseas. For example, the state uranium company KazAtomProm has developed a very unique uranium extraction process, which it patented. Another example is the new technology developed by the state oil and gas company KazMunayGas to enhance oil extraction through the use of 3D modelling systems.

Building on the country's specialisation in oil, gas and uranium, additional investments are necessary in order to transform SOEs in these sectors from mere importers of technology to global leaders and exporters of new technology. The focus should be not only on mineral extraction but also on the mining engineering industry, following the example of countries like Australia and Chile (Yusuf, 2015). Priority research areas include in particular the following (Cengel, Alpay and Sultangazin, 2013):

- technologies for the exploration and discovery of new mining resources
- quality control of field development
- modern extraction and enrichment methods
- developing fields with depleted reserves and hard-to-enhance oil recovery
- maintenance of drilling and blasting equipment
- technologies for the processing of uranium and associated waste management.

In parallel, the Kazakhstan 2050 Strategy places a strong emphasis on the need to develop a more sustainable energy and mining sector. This will require the adoption of new technologies and strategies aimed at improving energy efficiency and promoting renewable energy (Razavi, 2014). In particular, the country has a strong potential for wind, hydro, solar and bio energy that still needs to be developed through the acquisition and adaptation of international technology.

Sources: Cengel, Y.A., S. Alpay and A. Sultangazin (2013), *Science, Technology, and Innovation in Kazakhstan*: *Atlas of Islamic-World Science and Innovation*, www.aiwsi.org/imgs/news/image/atlas-country-case-kazakhstan-en.pdf; Razavi, H. (2014), "A sustainable energy sector"; Yusuf, S. (2015), "Knowledge-based economic growth in Kazakhstan", http://dx.doi.org/10.1177/0974910115592284.

Although in general SOEs have not contributed to innovation in the country, recent research has underscored that, if properly managed, they can play a very positive role in meeting innovation policy objectives (Tonurist, 2015). SOEs are the most likely adopters of technology developed by Kazakh universities and public research institutes, especially in certain strategic sectors such as mining and energy. This process could be stimulated through new policy tools, such as the strategic use of public procurement for innovation that helps to better connect research efforts at universities and public research institutes with the demands of SOEs by creating a market for these institutions' products.

In the coming years, Samruk-Kazyna plans to enhance the R&D activities of SOEs substantially in order to support the national industrial diversification strategy (Box 5.8). In this context, it is of critical importance to improve the governance of SOEs and to ensure that they improve their innovation management practices. In particular, the management of IP and technology transfer should become better integrated within the innovation strategies of SOEs.

The new law enacted in 2011, which obliges Samruk-Kazyna to invest 10% of its net profit in R&D and innovation activities, is expected to play a strong role in increasing business innovation in Kazakhstan. Such investments should be made in partnership with local universities and public research institutes, under an open innovation model, and additionally include foreign partners whenever deemed necessary. This will increase the importance of having an appropriate IP regulatory framework and clear guidelines for managing IP in research consortia, as discussed above.

Kazakhstan's large private firms hardly generate any patents either. Only 5.6% of the 73 large private firms included in the World Bank 2013 Enterprise Surveys declared investing in R&D, against an average of 18.8% for Europe and Central Asia (ECA) countries. The relative performance of Kazakhstan's large firms is also very weak in other indicators of product innovation, process innovation, organisational innovation and human capital (see also Table 2.4 in Chapter 2). Their adoption of new technology is mainly based on licensing foreign technology: 20.8% of the sampled large firms stated they license technology from abroad (see also Figure 4.9 in Chapter 4).

There are of course a few exceptions, such as the pharmaceutical company Romat, which has applied for two PCT patents since 2011. The company was founded in 1992 as a wholesale and retail pharmaceutical firm, but has upgraded to become a large-scale producer of drugs with three modern plants in the country and increasing R&D activities. This kind of company could serve as an initial candidate to build private demand for technology developed by Kazakh universities and public research institutes.

Box 5.8. The new innovation strategy of Samruk-Kazyna

The Samruk-Kazyna sovereign wealth fund owns many of Kazakhstan's most important companies, including the national rail and postal service; the state oil and gas company KazMunayGas; the state uranium company KazAtomProm; the national airline Air Astana; the national telecom company Kazakhtelecom; several chemicals and pharmaceutical companies; and numerous financial groups.

The dominant innovation strategy of state-owned enterprises (SOEs) within the fund has been, as noted above, based on acquiring and adapting foreign technology rather than developing their own technology. However, in recent years fresh efforts have been made to increase the innovative capacity of SOEs. Since 2011, the Samruk-Kazyna sovereign wealth fund is obliged by law to invest 10% of its net profit in R&D and innovation activities. The fund is currently developing a large corporate R&D centre within the premises of the new science park at Nazarbayev University. Moreover, since 2012 all companies within Samruk-Kazyna are required to prepare an innovation strategy, with specific objectives and performance indicators, following a common template so that the fund can better integrate and monitor the process of innovation. As part of the new innovation strategy, it is expected that the use of patents among SOEs will increase substantially.

Innovation is seen as a necessary component to spur industrial diversification, which has become a key objective of the national economic strategy, and hence of Samruk-Kazyna. In this context, Samruk-Kazyna has engaged in new strategic research areas like chemistry, machinery, robotics and IT. In April 2015, Samruk-Kazyna announced its plan to open an innovation centre in the Silicon Valley to engage in research partnerships in strategic areas (i.e. renewable energies, IT, medicine, transportation and agriculture), with universities such as Stanford and the University of California, Berkeley, with large multinationals, and with technology-based start-ups.

Sources: Interview with representatives of Samruk-Kazyna; http://sk.kz.

Large firms use trademarks more frequently than patents or utility models. The case of RG Brands illustrates well the use of trademarks by leading Kazakh firms as part of their strategy to upgrade the quality of products and boost exports (Box 5.9).

5.4.2. Intellectual property use in Kazakhstan among foreign multinationals

To date, foreign multinationals have hardly carried out any R&D activities in Kazakhstan. The largest share of foreign multinationals in the country is concentrated in the extractive industries, and they tend to bring all their technologies from abroad rather than conduct R&D locally (Yusuf, 2015).

Box 5.9. **Strategic use of trademarks: The case of RG Brands**

RG Brands was first established in 1994 as a distributor of imported products in the food and beverage industry. Over the years, through increased investments in R&D and innovation, the company created its own products, which have become some of the most popular brands in Kazakhstan. These products include juices, nectars, tea, carbonated soft drinks, milk, iced tea and snacks. RG Brands currently has around 1 800 employees in Kazakhstan. Besides having achieved a leading position in the national market, the company has substantially increased its sales in other Central Asian countries such as Kyrgyzstan, the Russian Federation, Tajikistan and Turkmenistan.

The process of transforming the company from a distributor to a producer of high-quality products was accompanied by efforts to create recognisable brands. Developing the company's first brand of juices (Da-Da) in 1999 marked the beginning of the implementation of RG Brands' strategy. The company's nine brands share a common focus of conveying their Kazakh roots. The company prioritises its original brands' tastes and value-added features that cater to Central Asian consumers.

Besides using the national intellectual property (IP) office to register its trademarks, RG Brands made use of the Madrid system that allows for the international registration of marks in its internationalisation strategy. In 2004, RG Brands was granted international trademark registration for its most popular product, Piala tea, and this registration was of critical importance for its international expansion. RG Brands has filed other international trademark applications, including for the company's Moë milk products in 2005 (registered in Kazakhstan, Kyrgyzstan and Uzbekistan) and Da-Da Day, Gracio, Grizzly and Sunny Nectar, which were registered through the Madrid system in 2013.

Use of the IP system was thus an important element in the strategy of RG Brands in shifting from being a mere distributor of imported products to a major producer of some of the most recognisable food and beverage products in the Central Asian market.

Source: WIPO (2014), "Shifting from brand importer to brand innovator: RG Brands, Kazakhstan", www.wipo.int/ipadvantage/en/details.jsp?id=3686.

However, this is starting to change following new regulations that require firms active in the subsoil sector to invest at least 1% of their total revenue in R&D activities. This measure could induce foreign companies to invest in R&D locally, possibly in collaboration with local universities and research institutes.

In addition, as part of its economic diversification strategy, Kazakhstan has begun to attract more foreign multinationals in non-extractive sectors and in more technology-intensive activities, including car manufacturing,

pharmaceuticals, information technologies, engineering, transport infrastructure, chemicals and renewable energy (see Chapter 2). As a result of these developments, foreign investors should gradually become more active users of the IP system in Kazakhstan.

Traditionally, the R&D and innovation centres of multinationals within the Eurasian region were mostly concentrated in the Russian Federation and Ukraine, given their larger market size and technological development. But in recent times the relative attractiveness of Kazakhstan for R&D-related foreign direct investment (FDI) has increased substantially, given the development of the Eurasian trade union, geopolitical turbulences in the Russian Federation and Ukraine, and the overall improvements in Kazakhstan's investment climate and national innovation system. Among other factors, improvements in Kazakhstan's IP system and the advantages of the Eurasian patent contribute to increasing the country's attractiveness as a destination of FDI in R&D.

Despite recent improvements, further actions are necessary to improve the IP regime in response to the needs of multinational companies that go beyond the scope of this study. Important topics for multinational companies relate, notably, to the topic of parallel imports, unfair competition and the enforcement of IP rights. The forthcoming *OECD Investment Policy Review on Kazakhstan* (OECD, forthcoming) will cover some of these themes as regards foreign companies.

An improved IP system is just one of the necessary conditions required to attract the higher value activities of multinational companies. The Kazakhstan Investment Attractiveness Survey carried out by Ernst & Young (2012) acknowledged the strong progress of the country in terms of general investment climate, but pointed out several weaknesses with regard to R&D and innovation. In particular, only 15% of respondents rate the availability and quality of R&D positively. The survey also revealed deficiencies in transportation and telecommunications infrastructure; in education and workforce training; and in the low level of interest of the younger generation in pursuing engineering and technical careers. The quality of the IP system is also important, as multinationals will be more willing to engage in research if they know IP ownership is guaranteed.

5.4.3. Policies to support intellectual property use of frontier innovators

Large Kazakh firms and foreign multinationals operating in the country benefit from different types of government support to promote the uptake of IP. A critical way for a country like Kazakhstan to catch up is to link with foreign sources of knowledge. One mechanism for international technology

transfer is to provide incentives to attract the kind of FDI that brings new technologies into Kazakhstan and generates knowledge spillovers onto the national innovation system. It is also important to seek international protection of IP developed by Kazakhstan's most innovative firms, and to support their international technology commercialisation efforts.

Some of the support measures discussed earlier in this chapter for SMEs and entrepreneurs are equally relevant for large firms and frontier innovators, such as the grants offered by the NATD for technology commercialisation and for international technology transfer, the support for international technology screening provided through the NATD's international technology transfer centres, and the various training courses and awareness-building initiatives organised by several institutions.

In addition, until 2015 the NATD offered a grant for patenting abroad, which was targeted to the country's firms that sought protection of their most valuable inventions globally (see also Table 2.6 in Chapter 2). Firms were offered up to USD 69 000 (KZT 6.25 million) to apply for a patent in foreign offices through the PCT system, to cover the cost of registration once the patent was granted, and to cover the costs of maintenance of the patent over a period of three years. However, the grant has not been used at all, suggesting that domestic firms are still not prepared for patenting abroad – thus costs might not be the constraining factor. It seems that up to now, international patenting only takes place when there is an international partner. In addition, many firms were not aware that they would be eligible to receive this grant. Although this grant is no longer offered, expenditures on patenting abroad can be covered by any grant for innovation.

Since June 2015, the NATD also offers advisory services relating to licensing contracts with foreign nationals. These services consist of reviewing the contract and providing recommendations to improve the contract's terms to protect the interests of domestic firms. In the first two months of operation, the NATD received requests to review 25 licence agreements, mainly from Kazakh firms in the process of licensing technology from abroad. This suggests that the service responds to a need that firms face in Kazakhstan.

Confirming the importance of international technology transfer, in addition to the NATD grant for technology transfer and its international technology transfer offices, in April 2015 Samruk-Kazyna announced a plan to open an innovation centre in the Silicon Valley, to screen the latest technological developments and engage in new research partnerships (Box 5.8).

The development of new science and technology parks in the country offers an excellent opportunity to attract the R&D centres of foreign

multinationals and to link them with domestic universities and firms. To complement these efforts, the national investment promotion agency, Kaznex Invest, should raise international awareness of the new advantages that Kazakhstan offers as a destination for R&D-related FDI, through marketing campaigns and international missions. In this context, it would be important to showcase recent improvements in the national IP system and to underscore the advantages of the Eurasian patent. This, of course, requires corresponding efforts to improve national capacities, notably the availability of human capital that currently is a constraint in Kazakhstan, as well as improvements in business conditions more generally.

Notes

1. Calculations are based on monthly newsletters from the National Institute of Intellectual Property (NIIP).
2. See: www.knowledgetransferireland.com/Model-Agreements.
3. See: www.gov.uk/guidance/lambert-toolkit.
4. www.eua.be/activities-services/projects/current-projects/research-and-innovation/Responsible-Partnering-Initiative.aspx.
5. www.ip-tradeportal.com/valuation.aspx.
6. The NATD had a similar but smaller grant scheme before 2016.
7. Examples of such associations that have been successfully established in other countries include the UNITT in Japan, RedOTRI in Spain, AURIL in the United Kingdom and the Réseau CURIE in France.
8. This kind of associative approach has already been adopted in several countries, including Canada (NCE-KM), France (SATT), New Zealand (Uniservices and KiwiNet), Portugal (UTEN) and the United Kingdom (N8). Youtie and Shapira (2008) provide an interesting analysis of the Georgia Research Alliance, formed by six universities in the US state of Georgia.
9. This paragraph is based on the speech of Rakhim Oshakbayev, Vice-Minister of Investments and Development of Kazakhstan, at the OECD Ministerial Meeting World Science and Technology Forum, "Science and innovations for global inclusiveness", Daejeon, Korea, 21 October 2015.

10. According to Yusuf (2015), some the priorities include the following: developing drought-resistant and nutrient-rich strains and compatible chemicals and pesticides; better machinery for seeding, fertilising and harvesting land, as well as for the use of GPS, sensor technologies and drones that map the condition of the soil and its moisture content; new techniques that economise on water use and pollution and that minimise spoilage and losses in storage, handling and transport.

11. The yurt is a traditional nomadic dwelling made of natural and renewable raw materials, which can be easily assembled and dismantled rapidly.

12. For example, there is a widespread practice of cooking techniques aimed at long-term preservation of food, including the salting and drying of meat and the use of sour milk – a legacy of the nomadic tradition.

13. In 2014, two items were added to UNESCO's Representative List of the Intangible Cultural Heritage of Humanity. The first related to the traditional knowledge and skills required in making yurts. The second involved the traditional art of Dombra Kuy, which refers to classical and improvised music compositions performed on a traditional two-stringed instrument known as "dombra".

14. These shares were by far the lowest among the countries covered in the Asian Development Bank's *Asia SME Finance Monitor 2013* (ADB, 2014a).

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Chapter 6.

Developing intellectual property markets in Kazakhstan

This chapter reviews Kazakhstan's policies, practices and challenges for creating intellectual property (IP) markets, i.e. market opportunities for inventors to sell or license IP titles to interested buyers. Based on international experiences, it suggests ways forward regarding IP valuation and financing.

IP (intellectual property) titles can powerfully facilitate innovation if inventors can trade their IP titles – that is to say, if they can sell or license them to potential private and public buyers, financial institutions, or intermediaries. IP markets bring benefits to both sellers and buyers: they allow IP owners to profit from the licensing or selling of their IP titles to interested buyers; and buyers benefit from access to technologies they may not have been able to develop in-house but that will be relevant to their business. Sellers, by contrast, may not have had the means to transform IP into a marketable product; this is very often the case with researchers. The opportunity of trading IP may provide wider opportunities for small-scale innovators, and allow more inventions to emerge as well as more innovations to be introduced into markets, supporting growth (Arora, Fosfuri and Gambardella, 2001) (Box 6.1). Finally, IP titles can also help access funding if accepted as collateral or grants, attenuating a challenge common to innovators: access to external credit.

Kazakhstan has engaged in early efforts to develop IP markets and establish the legal and administrative conditions to enable IP markets; these efforts are valuable, as uptake and ownership of IP will in turn become more attractive for the reasons outlined above. The challenges that need to be addressed to facilitate such markets include reducing high search costs (i.e. finding the seller and buyer more easily) and facilitating valuation to allow an adequate price to be set for buyers and sellers. Creating an efficient market also requires inventors and buyers to be actively engaged. Finally, for financing models to materialise, the financial sector is an important partner to have on board.

Many OECD countries and advanced partner countries have engaged in policy efforts to facilitate IP markets; these can inform Kazakhstan's future plans for establishing IP markets. The evidence also shows that long-standing efforts are often essential, even where conditions for innovation are more advanced.

This chapter reviews Kazakhstan's efforts to date in developing IP markets specifically to help the commercialisation of public research, and future developments of IP valuation and financing. It also discusses policy options based on best practice from international experience.

Box 6.1. The potential of intellectual property markets and challenges needing to be addressed

Intellectual property (IP) markets – i.e. (actual or virtual) places where buyers and sellers trade IP assets – provide profit opportunities for innovators and enable innovators to survive as pure technology suppliers. They also enable universities and public institutes to commercialise their IP titles. Licence royalties and sales of IP can provide direct funding for further innovation investments. For technology users, IP markets serve as an external technology source to substitute, either partly or totally, for in-house R&D that may be costlier to realise. IP markets may therefore allow for "a division of innovative labour", allowing different players to leverage their comparative advantages and thus increasing the efficiency of technology development and commercialisation. The invention itself (the strong point of the researcher) may be dissociated from the development of a product to be launched on markets (the strong point of the firm).

Moreover, IP assets can be used to access external financing from financial institutions. Common IP financing arrangements include IP securitisation and IP collateralisation (Halt et al., 2014). IP securitisation refers to the issuance of securities (bonds or shares) backed by future royalty payments from the licensing of a patent, trademark, trade secret or copyrights. IP collateralisation refers to obtaining loans from financial institutions with IP as collateral.

The development of IP markets is constrained by several challenges. The major problem is that the numbers of buyers and suppliers for a specific IP asset are often very limited, resulting in high search costs and consequently limited trade. Measures to address this problem and decrease search costs include the creation of online IP marketplaces (discussed below), through which innovators can disclose IP assets offered for sale and IP users can display their needs.

Another challenge involves valuation uncertainties. The value of IP assets is subject to the effects of various market and technology factors that may change significantly over time, resulting in a high level of uncertainty. For instance, the creation of a superior substitute technology can totally wipe out the value of an existing IP. Valuation uncertainties hinder licensing activities, and discourage financial institutions from accepting IP assets as collateral.

Source: OECD (2014), *National Intellectual Property Systems, Innovation and Economic Development: With Perspectives on Colombia and Indonesia*, http://dx.doi.org/10.1787/9789264204485-en.

6.1. Enabling commercialisation of public research

6.1.1. Legal changes to empower knowledge markets for public research

The creation and implementation of a legal framework for IP transactions are critical preconditions for creating IP markets. Giving research institutions ownership and researchers rewards for research contributions to industry is a further step. Set out initially in the Law on Science in 2011, the new Law on Commercialization of Scientific Activities, approved in 2015, marks the efforts of Kazakhstan in addressing the issues of ownership of research output and rewards for researchers in public-funded research; however, further efforts are required to implement the law effectively, as described in Chapter 5. The 2015 law grants more independence to universities and public institutes in managing their IP titles, including providing exclusive licensing of IP to firms without consent from government authorities (Article 14). This allows quick implementation of a licence contract, making public institutes more attractive as suppliers of technologies in IP markets.

The new law also specifies that IP assets can be pledged as collateral for firms to obtain credit and as capital investment for start-ups (Section 2 of Article 14). Those provisions, however, still require adequate implementation to facilitate IP financing.

6.1.2. Institutions aimed at supporting intellectual property marketplaces

Early efforts at creating technology transfer offices

Efforts aimed at supporting IP markets have been made since 2010, with the creation of technology transfer offices (TTOs) within universities and with the establishment of agencies and programmes to provide advice to potential IP buyers of the technology offered by universities, as discussed in Chapter 5.

The knowledge broker services of the National Center for Scientific and Technical Information

The National Center for Scientific and Technical Information (NCSTI), under the Ministry of Education and Science, aims to act as a transparent broker to promote, both locally and abroad, technologies patented in Kazakhstan that are ready for commercialisation. It also surveys the technology demands of Kazakh industries, helps identify relevant technology offers, and provides advice to Kazakh scientists on the commercialisation and patentability of R&D

outputs. To implement this agenda, the NCSTI has also organised events to bring together scientists and investors; three events were held in 2014.

The NCSTI also developed the web portal "Electronic Market for Innovation", to provide information on the results of research conducted in Kazakh universities and public research institutes, as well as on patents registered. The objective of the database, which is no longer updated and consequently only has information for 2009-12, was to attract investors to projects with commercial potential.

Similar practices of disclosing offer-for-sale IP information through online marketplaces exist in other countries; they can be effective in reducing search costs and increasing IP transactions (Box 6.2). For instance, an IP marketplace set up by the Danish Patent and Trademark Office has seen listed patents grow from 40 in 2007 to 284 in 2011, and has also attracted more foreign users in recent years (DKPTO, n.d.; Kongstad, 2012). As an emerging market example, in 2012 20 inventions were licensed in Malaysia through PlaTCOM, one of the country's online IP marketplaces (OECD, 2015a).

The more comprehensive they are, the more valuable online databases are; the chances of finding relevant technologies are thus more likely and consequently more buyers search the platform, rendering the platform more relevant to sellers. This suggests that Kazakhstan should consider offering connected IP marketplaces with the following characteristics, which the most successful international sites share:

- They disclose information not only about patents, but also about copyrights, trademarks and other types of IP assets offered for licence or sale. Providing explanations of the technologies protected in simple non-legal language helps firms find suitable technologies.
- They enable all types of IP holders – enterprises and individuals, whether from Kazakhstan or from abroad – to submit their IP for licence or sale.
- They connect to international platforms, allowing buyers to identify relevant external offers, and in return allowing Kazakh IP to be connected to global markets.
- They provide brokerage services to help users find partners more quickly for a reasonable service fee. If the marketplace operator cannot offer such a service, external brokerage firms can be recommended or bridged.
- They offer guidelines or tools for valuation and contract samples, decreasing the learning cost for new users.

- They update information – including by removing expired offerings, thus sparing users from the frustration of a search for information that proves invalid.

Box 6.2. **Creating intellectual property marketplaces: A global trend**

Online intellectual property (IP) marketplaces are often operated by patent offices or IP brokerage firms. An example of the former is the WIPO GREEN marketplace for sustainable technology (www3.wipo.int/wipogreen/en) set up by the World Intellectual Property Organization, which lists IP assets and needs related to green technologies. It has a wide user base, including clients from developing countries, and has helped score international success. For instance, Eco Sanitation Ltd., a South African company that developed a waterless toilet, finds online IP marketplaces an effective way of raising awareness of its product and attracting partners in developing new markets abroad (WIPO, n.d.). Another example is the IP Trade Portal set up by the Danish Patent and Trademark Office in 2007 (DKPTO, n.d.). Aside from functioning as an IP market for supporting materials, such as guidelines for trading IP rights, the portal also provides standard contract and valuation tools.

Some IP brokerage firms have also created online IP marketplaces. Users can place requests on the site for free or with minimum fees. The operator charges a small service fee for successful deals. Additional fees are required for offline services. An example is the China Technology Exchange Co., Ltd (CTE), a Chinese IP brokerage firm set up in 2009. It is jointly owned by three companies – one specialised in equity trading, the second in business start-up services and the third in investment. The Ministry of Science and Technology, the State Intellectual Property Office, the Beijing government and the China Academy of Science provide support for its operation. By the end of 2014, the CTE had arranged 68 000 technology transactions for a total amount of CNY 98.5 billion (USD 15.6 billion). It also has a highly comprehensive online marketplace (www.ctex.cn). Users can publish information on patents and trademarks they are offering to sell or buy, and find potential projects in which they are seeking to invest. Technologies and IP assets are classified according to their application field and are searchable. The platform also displays technologies developed by large state-owned enterprises (SOEs), public research institutes and universities. Value-added services, such as leaving comments for a displayed IP, are provided to users subscribed to paid services.

Sources: DKPTO (n.d.), IP Trade Portal, www.ip-tradeportal.com; WIPO (2016), "WIPO GREEN – The marketplace for sustainable technology", www3.wipo.int/wipogreen/en; WIPO (2014b), "Green technology diffusion: The case of ecosan waterless toilets", www.wipo.int/edocs/pubdocs/en/wipo_pub_951_6.pdf, WIPO (n.d.), "Module 11: IP Valuation", www.wipo.int/export/sites/www/sme/en/documents/pdf/ip_panorama_11_learning_points.pdf; www.ctex.cn.

The contributions of the Technology Commercialization Center to intellectual property markets

The new Technology Commercialization Center (TCC), an agency created under the World Bank Technology Commercialization Project (2010-15; see Chapter 5, Section 5.1.2), has contributed to the creation of IP markets by

helping to link Kazakh scientists to domestic and international technology markets. The TCC has searched the availability of marketable technologies in the country and created a catalogue of relevant research.

A follow-up World Bank project, the "Fostering Productive Innovation Project" (2016-20), plans to enhance the activities initiated by the TCC to increase the deal flow of IP transactions using a team of expert consultants. In addition, the project also aims to set up technology acceleration offices outside of Kazakhstan. These are meant to support Kazakh technology companies by providing information on foreign markets and technology trends, and facilitating interaction with foreign institutions to foster commercialisation. Also foreseen is capacity building support for existing TTOs at major Kazakh universities.

6.1.3. Creating a dynamic domestic industry to produce and source intellectual property

The emerging IP market in Kazakhstan lacks the presence of enterprises, as technology suppliers and also as a source of demand for IP. Although Kazakh enterprises, including large SOEs, traditionally perform very few R&D activities, the requirement of more R&D investment from SOEs (see Chapter 5) may not only increase the technologies that enterprises develop for in-house use, but also create more demand on their part for technologies developed elsewhere.

Kazakh enterprises do source technology from abroad but invest little in building local capacities. Such sourcing is critical for catching up, but ideally should be combined with local R&D in order to increase the technology absorptive capacity of Kazakh firms. Local technological capacities are crucial for introducing adjustments to technologies from abroad so as to make them more suitable to accommodate circumstances specific to Kazakhstan.

6.2. Addressing intellectual property valuation in the future

Trading IP requires sellers and buyers to determine a value for their transaction. Often the licensor and licensee have different views regarding the prospects of the IP. This results in a gap in the perceived value of the traded technology, which could indeed halt the transaction. A fundamental challenge is that patents themselves may not show the potential of the innovation developed on their basis. Further efforts are often needed to transform an invention into an innovation, and these can fail. Moreover, even if successful, consumers may not take up the product or it might be replaced by superior technology quickly, particularly in fast-changing technology

fields. In view of this, IP valuation is key, but remains a challenge – even in more advanced OECD countries.

6.2.1. Priorities for intellectual property valuation in Kazakhstan

According to interviews conducted for this review, the Ministry of Education and Science plans to draft legal rules for IP valuation as a way to facilitate the success of the Law of Commercialization of Scientific Activities, i.e. by increasing the commercialisation of public-funded research.

Currently, IP valuation is most relevant to Kazakhstan for the following purposes:

- IP valuation is an essential element for infringement litigations as compensations need to be decided. Training judges on IP matters is consequently critical. Better advice as to what valuation approach to follow can support the quality of the legal system's support of the IP system.
- IP valuation can help Kazakh enterprises seeking to import technologies, by providing them with guidance on the price they should be willing to offer. Services aimed at providing advice on foreign licensing have been taken up by a number of Kazakh users.
- IP valuation is critical apart from transactions, notably for public grants and other support programmes. Public support should initially focus on promoting the use of IP by inventors; however, once a critical threshold of uptake has been achieved, only those types of IP with commercial value should be supported. The Ministry of Education and Science, the Ministry of Investment and Development, and their implementing agencies need to assess IP created in public-funded R&D projects, and select projects based on their commercialisation potential.

6.2.2. Ways to facilitate intellectual property valuation in Kazakhstan

The following steps are useful for facilitating IP valuation in Kazakhstan:

- First, successful IP valuation requires a learning process; pilots to explore best practices are therefore important. The methods applied, the process and results should be taken into consideration in establishing general principles and rules for IP valuation in the context of Kazakhstan's technology market.

- Second, it is useful to collect data on transactions. Since there are only limited cases of IP transactions in Kazakhstan, collecting data from international transactions can be very helpful, especially those relating to the agriculture, natural resource processing and heavy machine building sectors. Private commercial databases can be utilised as well as public sources. Building a database of IP transactions involving domestic entities over the long term is useful, as these transactions reflect more concisely the industrial characteristics, market conditions and legal environment of Kazakhstan. Bearing in mind that IP valuation practices differ in different scenarios, categorised transaction records could help better develop rules for practice for purposes of financial reporting, court litigation, collateral and capital contribution.
- Third, the lack of qualified valuation service providers in Kazakhstan requires using costly valuation services from abroad, discouraging the wide usage of such services. Investments in developing the local skills base for IP valuation should evolve as demand develops so as to avoid an oversupply of trained staff, leading to a waste of resources. One solution may be to nurture specialised valuation agencies. Certain policy measures implemented in Japan can be a reference for Kazakhstan, such as subsidising valuation fees and supporting the diffusion of best practices (JPO, 2014; SME Support, Japan, 2015; HEDC, 2015).
- Fourth, making intelligent use of IP valuation guidelines already developed in other countries and adjusting them to national needs would be most relevant for Kazakhstan. A possibly useful source may be the *Guidelines on IP Assets Valuation* by the China Appraisal Society, under the Ministry of Finance of the People's Republic of China (hereafter "China"). These were officially released 31 December 2015, and will take effect as of 1 July 2016 (China Appraisal Society, 2015). Although very general, these guidelines lay down principles for valuation applications in different scenarios of relevance to Kazakhstan, namely transfer/licensing, capital contribution, litigation and financial reporting.

Box 6.3. Qualitative and quantitative methods for intellectual property valuation

Intellectual property (IP) valuation requires expertise in technology, law and the market. Different approaches may be used, depending on the purpose of valuation.

Qualitative valuation is useful in preliminary screening of high-quality IP rights. Such valuation provides a rating for or descriptive analysis of the quality of the IP, based on several factors. For patents, factors considered include technical aspects, such as innovativeness or the technical contribution to prior art; legal aspects, the strength of the patent claims, the geographic coverage of the patent or the existence of litigations in court; and business aspects, such as the potential market for the patented technology and the relevance to other products or services in the market (Hall, Jaffe and Trajtenberg, 2005; Reitzig, 2003). These factors can have varying weight in the valuation. The qualitative approach is especially useful for IP management purposes, so as to have an overview of the importance of different parts of the IP portfolio (Murphy, Orcutt and Remus, 2012).

To give a precise valuation of IP, quantitative methods are used that are based on the market, income and cost.

Market-based approach

The market-based approach assesses the value of IP by matching with the historical trading price of similar assets. For example, the value of a pharmaceutical patent may be expected to be close to that of the recently traded patent of a similar medicine. While intuitive as an approach – as IP assets are often unique – adjustments are needed to reflect the differences between the asset under valuation and the assets to which they are being compared. Insufficient public data of IP transactions are a major challenge for the application of market-based valuation (European Commission, 2014). Details of IP transactions are generally not disclosed to avoid leakage of sensitive information, such as ongoing R&D projects and alliances; this of course limits the sources of accessible reference data. Currently, the major source for transaction data is disclosures of merger- and acquisition-caused IP transactions and licensing agreements from security report and litigation outcomes. Lack of data will also be a challenge in Kazakhstan for another reason: the country is only just beginning to build IP markets.

Income-based approach

The income-based approach infers the value of IP from future income expectations. For IP assets that have a fixed licence agreement, the expected royalty income is discounted at its present value. For IP assets exploited in-house or under consideration for a licence, projections of the income of the IP asset over its remaining life are based on assumptions of business prospects and deduction of the contribution of other inputs, such as labour, capital investment and economic rents (Garland, 2004). An alternative approach to calculating the contribution of IP to business revenues is to multiply sales by a benchmark royalty rate of the industry, similar to the market-based approach (Goldscheider, Jarosz and Mulhern, 2005). The discounted net cash flows will then provide a valuation of the IP assets under consideration (Razgaitis [2009] provides detailed guidelines in applying discounted cash flows to IPs). The income-based approach has been widely used.

Box 6.3. **Qualitative and quantitative methods for intellectual property valuation** (*continued*)

Cost-based approach

With the cost-based approach, historical cost or the replacement cost serves as an indicator of IP value (Parr and Smith, 2005). Historical cost is the actual cost incurred in creating the IP, but it is often uncorrelated with the market value of IP, as high R&D expenditure does not guarantee successful outcomes. A more relevant value indicator is the replacement cost, defined as the assumed cost for getting equivalent IP assets from the market. However, estimating replacement costs requires data on transactions of comparable assets, which are often not readily available. (An exception is software, the reproduction cost of which is easy to estimate.) The cost-based approach is also used for early-stage technology that has not yet produced any revenue and that has a highly uncertain future profit potential (WIPO, n.d.). Generally speaking, the cost-based approach is not appropriate for transaction-oriented valuations, including IP licensing and financing.

Sources: European Commission (2014), *Final Report from the Expert Group on Intellectual Property Valuation*; Garland, P.J. (2004), "Intellectual property life estimation approaches and methods"; Goldscheider, R., J. Jarosz and C. Mulhern (2005), "Use of the 25% rule in valuing intellectual property"; Hall, B., A. Jaffe and M. Trajtenberg (2005), "Market value and patent citations"; Murphy, W.J., J.L. Orcutt and P.C. Remus (2012), *Patent Valuation: Improving Decision Making through Analysis*; Parr, R.L. and G.V. Smith (2005), *Intellectual Property: Valuation, Exploitation, and Infringement Damages*; Razgaitis, R. (2009), *Valuation and Dealmaking of Technology-Based Intellectual Property: Principles, Methods and Tools*; Reitzig, M. (2003), "What determines patent value?: Insights from the semiconductor industry"; WIPO (n.d.), "Module 11: IP valuation", www.wipo.int/export/sites/www/sme/en/documents/pdf/ip_panorama_11_learning_points.pdf.

6.3. Intellectual property financing: Preconditions and steps to be undertaken

IP financing is not yet an immediate priority for Kazakhstan since it requires a more advanced innovation ecosystem. However, once the innovative capabilities of domestic firms have improved, IP financing can become a reality. Financing tools based on IP assets can then help innovative firms obtain the capital they need for R&D investment, commercialisation and expansion. They therefore deserve further promotion.

However, international experience on IP financing (Box 6.4) shows that there are substantial challenges involved, including for the most advanced economies. For Kazakhstan, focusing on developing IP marketplaces and advances in IP valuation are consequently more critical at the present time than IP financing.

Box 6.4. The promise of intellectual property finance

Besides traditional forms of intellectual property (IP) financing, such as selling or licensing of intellectual property, there are new ways of exploiting the values of IP. For one, it can be used as collateral: banks can provide or increase loan amounts based on IP secured by IP owners. Another form, although less used, is IP securitisation. In this case, new securities are issued backed by IP assets. The revenues generated from such assets – such as royalty payments from IP licensing – are generally thought to be predictable. Similar to IP collateralisation, the cash flows obtained from IP securitisation can help finance innovators' R&D or expand their commercialisation activities, and thus in turn secure further funding from markets.

At the early stage of a start-up, IP has a signalling effect for venture capital investors. Particularly, patent filing signals that the R&D activities of technology-based start-ups are efficient. IP assets can also serve as a security by signalling repayment capabilities.

However, valuation uncertainties and liquidation difficulties have long been obstacles for making such IP financing a reality. So far very few economies have been successful in providing widespread IP-based financing for innovators. An overview of developments in the United States, Japan, China and ASEAN countries follows:

- In the United States, the market for IP-backed loans is gaining importance; Loumioti (2011) finds that the share of loans backed by intangible (mainly IP) assets among secured loans grew from 11% in 1996 to 24% in 2005. The size of such royalty financing is estimated at USD 3.3 billion in 2007-08 (OECD, 2013; 2015b). As for securitisation, copyrights and pharmaceutical patents are favoured as the royalty incomes are more predictable (Solomon and Bitton, 2015).

- In Japan, IP collateralisation is more active. From 1995 to 2007, the Development Bank of Japan (DBJ) assigned 300 loans with a total amount of JPY 16 billion (USD 150 million) (METI, 2007). The DBJ listed several difficulties in liquidating collateralised IP assets, including the lack of markets to sell them to in Japan. Moreover, if the bankruptcy of the borrower is attributed to technology failure, the patent itself becomes valueless.

- In China, the creation and utilisation of IP assets have changed dramatically over the past two decades. Although the 1995 amendment to the Guarantee Law permitted the use of IP assets as valid collateral, patent-backed financing was inactive in China until the mid-2000s, when banks began to experiment with adopting patent-collateralised loans. With the support of the government and expanded adoption by more financial institutions, 3 361 patents had been collateralised by 2011 (SIPO, 2011).

Box 6.4. **The promise of intellectual property finance** (*continued*)

- Among emerging economies, several ASEAN members have started experimenting with IP financing models. In 2012, Malaysia Debt Ventures, a publicly owned provider of loans, initiated Malaysia's Intellectual Property Financing Scheme to assist SMEs in obtaining IP-backed loans. Thailand's government also tries to promote IP collateralisation as a solution to the financing of SMEs. The SME Development Bank of Thailand, a specialised lender to financially constrained SMEs, is undertaking projects of IP collateralisation. In Viet Nam, while efforts have yet to begin, the banking industry has shown greater interest in IP collateral as an untapped potential for development (VietnamPlus, 2015).

Sources: Loumioti, M. (2011), "The use of intangible assets as loan collateral", https://msbfile03.usc.edu/digitalmeasures/loumioti/intellcont/TheUseOfIntangiblesAsLoanCollateral_Final-1.pdf; OECD (2013), *Supporting Investment in Knowledge Capital, Growth and Innovation*, http://dx.doi.org/10.1787/9789264193307-en; OECD (2015b), "IP-based financing of innovative firms", www.oecd.org/sti/ieconomy/KBC2-IP.Final.pdf; Solomon, D. and M. Bitton (2015), "Intellectual property securitization", www.cardozoaelj.com/wp-content/uploads/2014/01/Solomon-Bitton-Final.pdf; VietnamPlus (2015), "New IP financing trend could help SMEs access credit, grow", http://en.vietnamplus.vn/new-ip-financing-trend-could-help-smes-access-credit-grow/76942.vnp#; SIPO (2011), "3361 patents used as collateral all over the country, with 31.85 billion yuan debt financing" (in Chinese); METI (2007), "IP transaction and financing survey report" (in Japanese), www.meti.go.jp/policy/intellectual_assets/pdf/IP-circulation_finance/finance.pdf.

The first steps in Kazakhstan's IP financing should focus on relatively easier cases, such as the collateralisation or securitisation of licensed patents or copyrights (see Box 6.5 for a more detailed explanation). Licensed IP has a profitable business model; thus, the risk of licensed IP is lower than that which has not been used in a business. In turn, the future royalty income is more predictable, as the royalty rates are already fixed. Therefore, valuation of licensed IP is simpler and financial institutions are more willing to accept it. In the United States, for example, early practices of IP securitisation involved copyright and pharmaceutical patents, which have predictable license revenue. In Japan, with the support of the Ministry of Economy, Trade and Industry (METI), Scalar Corporation securitised its licensed optical lens patents and raised JPY 154 billion (USD 1.3 billion) (Watanabe, 2004). These kinds of pioneering projects can help financial institutions and intermediaries accumulate know-how to prepare for dealing later with more complex financing of IP assets.

Box 6.5. **Promoting the awareness of small and medium-sized enterprises of intellectual property valuation in Japan**

To promote awareness of intellectual property (IP) valuation in assisting management improvement and in financing backed by IP assets, Japan has initiated several projects at the levels of both local and central government.

In 2005, the Hyogo Economic Development Center (HEDC), a government agency of Hyogo Prefecture, initiated an "SME technology and management competency assessment programme". Under this programme, local small and medium-sized enterprises (SMEs) can request the HEDC to conduct an evaluation of the innovativeness of their technologies, their intellectual property (IP) assets and their business competency, and issue an evaluation report. SMEs can use the report for management improvement or submit it to financial institutions for credit analysis. Financial institutions can also request evaluation directly from the HEDC. The HEDC charges a fee of JPY 67 000 (approximately USD 550) for each standard case, and an additional JPY 67 000 (USD 550) for a customised evaluation request. By September 2015, more than 1 000 valuation reports had been issued (HEDC, 2015). These practices have served as models in other regions, including Hiroshima Prefecture and Fukuoka Prefecture.

To promote IP-backed financing, the Japan Patent Office (JPO) launched subsidies for IP valuation in 2014. The valuation fees charged by IP consulting firms may be fully subsidised by the JPO upon application. Thirty-seven applications were approved in 2014 (JPO, 2014). A budget of JPY 240 million for the subsidy programme was set for the fiscal year 2015 (JPO, 2014).

Several government agencies, including METI, the Japan Patent Office, and the Organization for Small & Medium Enterprises and Regional Innovation (SME Support) carry out surveys and provide research reports aimed at improving future policy support. SME Support also publishes a manual for IP collateralisation, which includes a detailed checklist for initial assessment of IP rights and guidelines for evaluating liquidity and IP asset value (SME Support, Japan, 2015). The guidebook also provides sample contracts and a description of legal procedures (including registration of collateralised IP assets).

Sources: HEDC (2015), "Hyogo small business technology and management competency evaluation system" (in Japanese), http://web.hyogo-iic.ne.jp/keiei/hyoukaseido; JPO (2014), "Support for drafting IP business evaluation reports" (in Japanese), www.jpo.go.jp/torikumi/chushou/h26_chizaichiteki_2ndkoubo.htm; SME Support, Japan (2015), "Manual for financing with IP collateral".

To help enable IP financing, setting an adequate legal framework in advance can alleviate the legal risks and stimulate innovative practices in markets for IP, as shown in countries that have experimented the most with IP financing to date. IP secured financing is governed by both IP law (for protection of IP) and secured financing law (for promotion of general assets,

mainly tangible assets). However, a number of specific characteristics of IP assets may not be well incorporated into general secured financing law. For instance, compulsory registration tends to be necessary to prevent a collateralised IP asset from being pledged to an unacknowledged third party (Bazinas, 2009). This problem has been recognised internationally and has stimulated efforts in legal infrastructure building for IP financing. In December 2007, the United Nations Commission on International Trade Law (UNCITRAL) adopted the UNCITRAL Legislative Guide on Secured Transactions, providing legislative recommendations for security interests. Later, in 2011, it released an IP annex with additional recommendations for security interests in IP, aimed at facilitating IP financing within the parameters of IP law (Bazinas, 2009; United Nations, 2011). The guide and the IP annex are very helpful as a checklist for countries at the early stages of setting up legal infrastructures for IP financing.

It is important to have laws in place for the financial sectors in terms of IP transactions – covering *inter alia* banking, securities and guarantees – to allow these institutions to accept intangible assets. There are of course other factors that will be critical – including the extent of protection and enforcement of IP rights – in guaranteeing the value of IP assets and consequently in providing opportunities for their use in financial transactions (Chapter 3).

Governments have played a critical role in enabling IP financing schemes to operate. Government support can take different forms, involving for example direct funding, subsidising interests, providing guarantees, assisting IP valuation and diffusing knowledge on IP financing. In Japan, for instance, only after years of direct public support have small local banks begun to utilise to any real extent IP valuation reports provided by public agencies or private consulting firms in their borrowing decisions. In Malaysia, the government provides interest subsidies and a guarantee of 50% principal repayment. The Singapore government also provides guarantees of partial repayment to encourage banks to accept patents as collateral (OECD, 2015a).

A new trend in IP markets is the involvement of public stakeholders. In several countries, sovereign patent funds have emerged in recent years, where government-backed capital is involved in part or entirely (Box 6.6). This government-backed capital is intended to play a role in protecting domestic industries from potential IP litigations or unreasonable royalty demands from aggressive IP holders. Providing financial support or counselling services to better develop indigenous IP is also a mandate for some sovereign patent funds. However, for Kazakhstan it is worth learning more about how these perform best over the longer run.

Box 6.6. **Countries as players in the intellectual property market: Sovereign patent funds**

The **Korean** government is participating in Intellectual Discovery, a patent fund of USD 500 million with a portfolio that currently includes over 3 800 patents. Intellectual Discovery provides financing support to or invests in companies with high-quality patents to help harness their global competitiveness.

The Innovation Network Corporation of **Japan**, launched in July 2009, is capitalised at USD 2.85 billion (JPY 300 billion), 95% of which is contributed by the Japanese government and the rest by 26 private corporations. It aims to provide financial, technological and management support to help commercialise Japanese patents with business potential.

France Brevets has funds of USD 120.5 million (EUR 100 million), half from the French government and half from a financial firm controlled by the government. It provides financial support to entities in building their patent portfolios with a long-term perspective, and focuses on licensing efforts.

The Guozhi Wisdom IP Equity Fund, a public-private partnership, was set up on 9 November 2015 with an initial amount of USD 28.3 million (CNY 100 million). The fund intends to help **Chinese** SMEs acquire essential patents so as to remove barriers to their business development, and to set examples to mobilise more private investments.

Sources: Intellectual Discovery (n.d.), Intellectual Discovery website, www.i-discovery.com/site/eng; Innovation Network (n.d.), Innovation Network Corporation of Japan website, www.incj.co.jp/english; France Brevets (n.d.), France brevets website, www.francebrevets.com/en; Guozhi Wisdom IP Equity Fund (in Chinese), http://ip.people.com.cn/n/2015/1109/c136655-27794748.html.

It should be pointed out that IP finance involves risks. Even in major developed OECD countries, the IP finance story is a mix of successes and failures. Other forms of property are sometimes used as guarantees to dilute risks involved in the transaction, and due diligence is much emphasised at the very start of process. Last but not least, the base for an IP market lies in the quality and quantity of the technologies available. Without the supply of technologies, even with the adequate legal and market environments in place, the IP market would lack dynamism.

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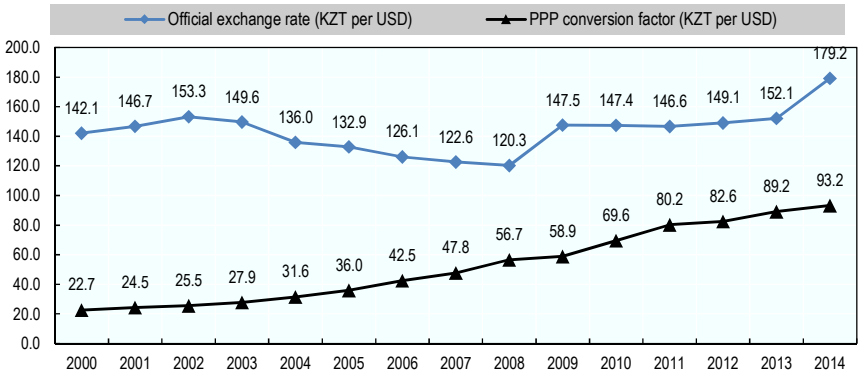
Annex A.
Statistical annex

All currency conversions presented in this Review have been calculated using purchasing power parity (PPP) conversion factors provided by the World Bank World Development Indicators (http://data.worldbank.org/indicator/PA.NUS.PPP). The PPP conversion factor is the number of units of a country's currency required to buy the same amount of goods and services in the domestic market that one US dollar would buy in the United States. Using the PPP conversion factor represents a more accurate estimate of the real purchasing power within a country than market exchange rates, which describe the purchasing power of a country's currency only with regard to internationally traded goods. Figure A1 presents the evolution of the Kazakhstani tenge to US dollar (KZT/USD) PPP conversion factor and the KZT/USD official exchange rate.

Figure A1. **Evolution of PPP conversion factor and official exchange rate, KZT per USD**



Source: World Bank (2015), *World Development Indicators*, http://data.worldbank.org/data-catalog/world-development-indicators based on the following sources: PPP conversion factors are based on data from the World Bank *International Comparison Programme database*, http://data.worldbank.org/indicator/PA.NUS.PPP; official annual exchange rates are based on data from the International Monetary Fund, International Financial Statistics, http://data.worldbank.org/indicator/PA.NUS.FCRF.

For example, to convert KZT 20 000 in the year 2008 to international US dollars using the PPP conversion rate, the calculation would be as follows: KZT 20 000/56.72 = USD 352.6. The official exchange rate value would be KZT 20 000/147.5=USD 135.59.

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