Macroeconomic Effects of Road Corridor Investment in Kazakhstan

General Equilibrium Perspective

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Infrastructure development across Central Asia facilitates connectivity, competitiveness, productivity, and ultimately economic growth and regional integration. A sample development project is a large road corridor in Kazakhstan. This report shows the economic impact of such a project. The quantitative work follows a dynamic general equilibrium model covering both direct and indirect effects, including trade facilitation, transport cost reduction, and increased productivity. The cumulative indirect impacts benefit Kazakhstan and the many economies linked to it.

As Asian economic integration advances, infrastructure challenges arise. Asia's growth has been indirectly associated with maritime trade routes established centuries ago. More recently, this growth has been driven by other transport modes, including road, rail, and air travel. Energy trade is also an important variable. This paper presents a forward-looking economic model that is used to determine the impact of significant infrastructure projects in Central Asia and beyond.

Previous experience in this area indicates that a well-developed economic model can elucidate the many indirect benefits of large infrastructure projects and regional trade facilitation initiatives (*1–3*). Such a tool can capture myriad indirect effects, including ones arising from regional integration. It can also better identify the efficiency and growth dividends for diverse stakeholders. With stronger evidence of benefits for such projects, particularly with respect to regional development and poverty reduction, policy makers can better justify their appropriate fiscal commitments and promote complementary bilateral–multilateral facilitation agreements.

If Central Asian countries are to realize their full economic potential, more effective trade integration within the region and the rest of Asia is essential (*4, 5*). Currently, these economies have limited demand levels because of their low average incomes and because their production structures are heavily specialized in primary commodities. To take full advantage of external markets that can expand demand for the countries' products and diversify consumption, more extensive and efficient transportation networks are being planned and constructed. This paper presents multicountry estimates of the potential national and regional growth benefits of sustained commitments to such investments.

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Ultimately, the gains from regional trade and transport development depend on the complex interplay of market forces, responses from households and firms to changes in the policy environment and market conditions, direct and indirect linkages among various sectors of the economy, and backward and forward linkages between the domestic economy and the rest of the world. Currently, there are no tools that would enable the policy makers in this region to make informed decisions on these issues. To overcome this limitation, a Central Asia Computable General Equilibrium (CA-CGE) model has been developed. This dynamic, multicountry CGE model links Central Asian countries directly to their key trading partners. The modeling results can inform more effective regional policy and multilateral dialogue in several ways for Central Asia, and may help policy makers to do the following:

- Assess effects of policy reforms in individual countries, including their effects on poverty and inequality (*6, 7*);
- Analyze the economywide and cross-border effects of major investment projects affecting the region, especially the projects that reduce trade costs for these countries (*8, 9*);
- Assess the effects of regional cooperation and integration initiatives;
- Make economic projections for individual countries; and
- Analyze economic and resource linkages (including energy) among countries in the region, and among them and other countries.

In its present form, the CA-CGE model includes Kazakhstan, the Kyrgyz Republic, the Xinjiang Autonomous Region of China, the rest of China, Russia, and the rest of the world. China has become an important trading partner for the Central Asian countries, with Xinjiang accounting for the bulk of China's trade with the Central Asian countries. Russia remains a leading trading partner for all Central Asian countries. It is also the main destination country for migrant workers from Central Asia. The base year for the model data is 2004. Subsequently, the model could be extended to include other neighboring countries and their trading partners.

TRANSBOUNDARY IMPACTS

Project

Infrastructure and other projects across the Central Asian region facilitate economic growth and regional integration. Included among these projects is a large road network project or corridor in Kazakhstan connecting Khorgos (a border town between Kazakhstan and China),

Almaty, Shymkent, and Aktobe (a border town between Kazakhstan and Russia). As Figure 1 indicates, this project involves not only many regions of this country (the world's seventh largest by land area), but also its major trade routes to neighboring and more distant trading partners. As with many large projects, the costs and benefits of this project will be complex and will be dispersed over time and across domestic, regional, and even global stakeholder groups. Using the new modeling facility, this paper examines the growth and other key effects of the project over the period 2008–2030.

The Kazakhstan road corridor project is very large, involving a total investment of about 7% of the country's 2007 gross domestic product (GDP). The economic value of the transport and distribution services that this corridor will provide, including collateral investments around the corridor, will grow in both absolute and relative terms to the rest of the country, where infrastructure services are generally inferior. The primary objective of this analysis is to elucidate the complex and far-reaching indirect effects that this project will have on economic growth across Kazakhstan, the Central Asia Republics (CAR), and even more distant regions.

Modeling Approach

The complexities of today's global economy make it very unlikely that policy makers relying on intuition or "rules of thumb" can achieve optimal economic results in domestic or international arenas. Market interactions are so pervasive in determining economic outcomes that more sophisticated empirical research tools are needed to improve visibility for both public- and private-sector decision makers. The preferred tool for performing detailed empirical analysis of economic policy is the CGE model. The model is well suited to trade analysis because it can detail structural adjustments within national economies and elucidate their interactions in international markets. The model has been fully documented elsewhere, but a few general comments will facilitate discussion and interpretation of the scenario results that follow (*10*).

Technically, a CGE model is a system of simultaneous equations that simulate price interactions between firms and households in commodity and factor markets. The roles of government, capital markets, and other trading partners are also specified, with varying degrees of detail and passivity, to close the model and account for economywide resource allocation, production, and income determination. The role of markets is to mediate exchange, usually with a flexible system of prices, which are the most important endogenous variables in a typical CGE model. As in a real market economy, commodity and factor price changes induce changes in the level and composition of supply and demand, production and income, and the remaining endogenous variables in the system. In CGE models, an equation system is solved for prices that correspond to equilibrium in markets and satisfy the accounting identities governing economic behavior. If such a system is precisely specified, equilibrium always exists, and a consistent model can be calibrated to a base period data

FIGURE 1 Map of road corridor project.

set. The resulting calibrated general equilibrium model can then be used to simulate the economywide (and regional) effects of alternative policies or external events.

The distinguishing feature of a general equilibrium model, applied or theoretical, is its closed-form specification of all activities in the economic system under study. This feature can be contrasted with more traditional partial equilibrium analysis, where linkages to other domestic markets and agents are deliberately excluded from consideration. A large and growing body of evidence suggests that indirect effects (e.g., upstream and downstream production linkages) arising from policy changes are not only substantial but may in some cases even outweigh direct effects. Only a model that consistently specifies economywide interactions can fully assess the implications of economic policies or business strategies. In a multicountry model like the one used in this study, indirect effects include the trade linkages between countries and regions, which themselves can have policy implications. CGE models, supported by reliable data resources, can elucidate these linkages and improve visibility for both policy makers and private stakeholders. Moreover, this kind of simulation framework permits policy makers to identify benefits and costs *ex ante,* recruiting those who gain to support policies and anticipating the adjustment needs of others.

In larger-scale project evaluations such as the one undertaken in this paper, significant economic effects can be seen to spill well beyond the borders of the domestic economy; these effects feed back into the subject economy because of the secondary effects on its trading partners (*11*). To capture these linkages, a multicountry model is more appropriate. This is the framework used in the present analysis, and, as one would expect in a region such as the CAR, with a relatively weak transport infrastructure, the results indicate that spillover effects are very important. The basic structure of a multicountry model consists of the following components:

1. Detailed economic data (2001–2002): social accounting matrices for each of the six CAR economies: Kazakhstan, the Kyrgyz Republic, Mongolia, Russia, China, and Xinjiang;
2. Estimated bilateral trade flow table to integrate the individual country data and detailed fiscal accounts;
3. CA-CGE model: a dynamic CGE forecasting model;
4. Data resources:
   – Version 6 of the Global Trade Analysis Project to provide the core data for the Russian and Chinese economies;
   – Kazakhstan, Kyrgyz Republic, Mongolia, Xinjiang: 2001 social accounting matrices estimated from official sources by the authors;
   – Trade data: estimated from raw data obtained from domestic official and multilateral sources; and
   – Other: trade and transport estimates.

Policy Scenarios

To elucidate the effects of the large-scale infrastructure project discussed here, its properties are examined with incremental policy scenarios, beginning with a baseline and estimating component effects of the project. The policy scenarios include a baseline that considers consensus growth estimates over the scenario period (2008–2030), assuming that no action is taken on the road corridor project. The first alternative policy scenario recognizes only the direct project financial effects and assesses these costs and benefits separately. This analysis includes the Keynesian impact of direct project expenditures and other standard transport project assessment variables, such as vehicle operating cost (VOC) savings and other direct usage benefits of the infrastructure.

These kinds of direct benefits are of course essential to understanding the local returns on infrastructure investments, but they fail to capture the extensive linkage effects across supply and expenditure chains that tie transport infrastructure to the wider universe of economic activity. For example, VOC savings measure the direct cost savings to a vehicle while it is using the corridor, but they do not address the economic implications of actually using the vehicle. For example, a cargo truck may save 10% on transit cost, but these cost benefits will multiply for all the downstream partners of the truck owner, including those who use the truck operator's services, the intermediate and final buyers of its contents, and all upstream and downstream suppliers of goods and services to the operator across its now-expanded range of profitable operation.

As reduced transport cost expands, the physical horizon of profitability for all transport services can be expected to increase the capacity use across a broad spectrum of existing transport–distribution activities, including to stimulate new private investment (*12, 13*). Energy fuel suppliers and appurtenant services (e.g., food and lodging) can be expected to grow not only along the corridor but also across a larger network of trade that has been made profitable by the corridor. This collateral growth effect not only increases road use but also integrates the national and regional economies, increases product variety, and sharpens the comparative advantage of products. Trade and unit profitability are increased by leveraging economies of scale.

The second policy scenario focuses on a central component of these collateral growth effects: the contribution of trade and transport productivity as distribution sectors experience lower costs and pass these gains on to all their client sectors (*14, 15*). The result of this scenario is more transport-intensive growth for the economy at the national, regional, and global levels. Because distribution services are essential to market access, rising productivity in the sector accelerates trade for all other sectors, extending growth in the transport services sector to the rest of the economy.

The third scenario captures another network growth externality: the benefit of reduced delays, product losses, and depreciation on transport-related products. For perishable products such as agricultural goods, such losses can be prohibitive, and reducing them significantly can dramatically increase rural market participation. For other commodities, even nonperishables, transport delays still cause economic losses because they escalate inventory and storage costs.

The fourth scenario shows the effect of falling trade and transport margins on trade, both domestically and across Kazakhstan's borders. Around the CAR, transport margins can be very high, in some cases exceeding 100% because of low-quality roads, border delays, and other soft and hard infrastructure obstacles (*16*). Corridors such as the one being evaluated can dramatically reduce these costs on an average basis, increasing the profitable scope of trade and also its intensity. (It is important to emphasize that cost reductions arising from the project will be averaged across supply chains. Not all operators will experience the same uniform cost reductions, and some operators will have no direct cost reduction if they do not use the corridor. Linkage benefits, via lower invoice costs for goods traveling in the corridor, are still important across national supply chains, however.) The description of the policy scenarios is as follows:

- VOC, including complete project outlays and estimated economic benefits from improved safety, travel time, and reduced vehicle depreciation;

- Productivity, including VOC and estimates of productivity gains for the transport and distribution sectors;
- Losses, including VOC, productivity, and reductions in product losses resulting from spoilage, damage, delays, and other adverse effects of roadway inefficiency; and
- Trade, including VOC, productivity, losses, and estimates of reduced trade and transport cost margins.

Main Results

Key project impact indicators are summarized in Table 1. When all direct and indirect impacts are taken into account (using the all-inclusive Trade scenario), completing the corridor project would lead to a 68% higher real GDP for Kazakhstan by 2020. A decade later (by 2030), these growth benefits would have compounded to achieve a real GDP nearly three times higher than in the baseline scenario. These results are a testament to the massive contribution of infrastructure to economic growth, reaching far beyond the direct financial effects of an individual project.

An important caveat should be kept in mind. Scenario results such as those reported here should be interpreted as indicative of the economy's potential to realize the growth benefits estimated from hypothetical effects on operating costs, productivity, and trade and transport margins. In this sense, these dramatic growth benefits represent upper bounds whose realization may be constrained by institutional imperfections and heterogeneity in the underlying environment (*17*).

For example, in the productivity scenario, a hypothetical change in the productivity of trade and transportation is assumed and is applied in the model uniformly across all users of these services. In reality, the incidence of productivity effects and the degree to which they are conferred upon downstream users will vary across the economy (*18, 19*). This heterogeneity will undermine the full realization of the potential growth benefits. Having said this, experiments with alternative scenarios indicate that the qualitative nature of outcomes is robust and that component policy benefits maintain their relative magnitudes, as does the implied distribution of benefits across stakeholder groups.

TABLE 1 Key Project Impacts, Percentage Change from 2010 Baseline

Impact Indicator	2020	2030
Kazakhstan GDP	68	290
Kazakhstan output		
Transport	79	356
Distribution	77	345
Kazakhstan exports		
Total	32	63
Kazakhstan imports		
Total	33	64
Other CAR	43	152
Russia	4	12
GDP		
PRC	6	17
EU-25	4	11
Other CAR	50	75
Russia	25	54
Kazakhstan exports to		
PRC	36	67
EU-25	28	61
Other CAR	48	75
Russia	27	56
Kazakhstan imports from		
PRC	37	69
EU-25	30	63

Within Kazakhstan, the directly affected transport and trade sectors will be even more dramatically affected, with real output growth being 79% and 77% higher, respectively, by 2020, and more than tripling by 2030. Detailed sector results presented later will show that some activities benefit less than those directly affected by the project but that the economywide effects are still substantial for most sectors.

As would also be expected, foreign trade is stimulated by the project, but less so than domestic economic activity. Exports and imports are 32% and 33% higher, respectively, by 2020, and 63% and 64% higher by 2030. These results are significant, yet they are smaller than domestic GDP growth for several reasons: (*a*) the initial domestic infrastructure is very weak, and the corridor thus makes a bigger contribution to network effects domestically; (*b*) growth over the next 20 years will involve significant emergence of the Kazakhstan internal market and formal sector, reducing the country's very high current trade dependence; and (*c*) GDP growth always includes an important compounding effect of savings–investment accumulation, which is absent from trade linkages.

The GDP effects of the project for Kazakhstan's trading partners reveal significant regional spillover from the project, including, above all, the CAR economies, with a combined GDP that is 43% higher than the baseline in 2020 and 152% higher in 2030. The effect is the greatest for immediate neighbors such as the Kyrgyz Republic, which has high trade shares with and through Kazakhstan and a relatively low initial GDP. This spillover in growth can be expected to radiate across the CAR and beyond and represents an important justification for this project in the regional policy dialogue. Despite their size and diversity, both Russia and China gain significantly from the project through trade linkages, with real GDP gains of 4% and 6%, respectively, by 2020, and 12% and 17% by 2030.

Bilateral trade flows reveal part of the growth leverage process, as CAR economies receive 50% more Kazakhstan exports and send 48% more imports by 2020, with these flows rising 54% and 75%, respectively, by 2030. Bilateral trade with the PRC is the next most dynamic trade flow, with demand for Kazakhstan exports rising 36% and 67% by 2020 and 2030, respectively, and PRC shipments to Kazakhstan growing 37% and 69% more in the same periods. Russian trade with Kazakhstan is about 25% higher in both directions by 2020 and is more than 50% higher by 2030.

More extensive GDP results for the project are given in Figure 2 and Table 2. These results show annual percentage changes in real (2010 U.S. dollars) GDP from the baseline trend, defined as a percent of 2010 GDP. As in Table 1 and as can be expected because of proximity and initial conditions (i.e., relatively low income), the main beneficiaries in relative growth terms are Kazakhstan and its closer regional neighbors.

Given these results, it is important to recognize the stake that all of Kazakhstan's trading partners have in regional infrastructure. European Union countries and even the distant United States capture significant benefits from improved CAR transport infrastructure because of their strong ties to the region through the energy and capital goods markets and their relatively high import and export elasticities. These results support the essential message that the benefits of this large national project are truly multilateral. Significant

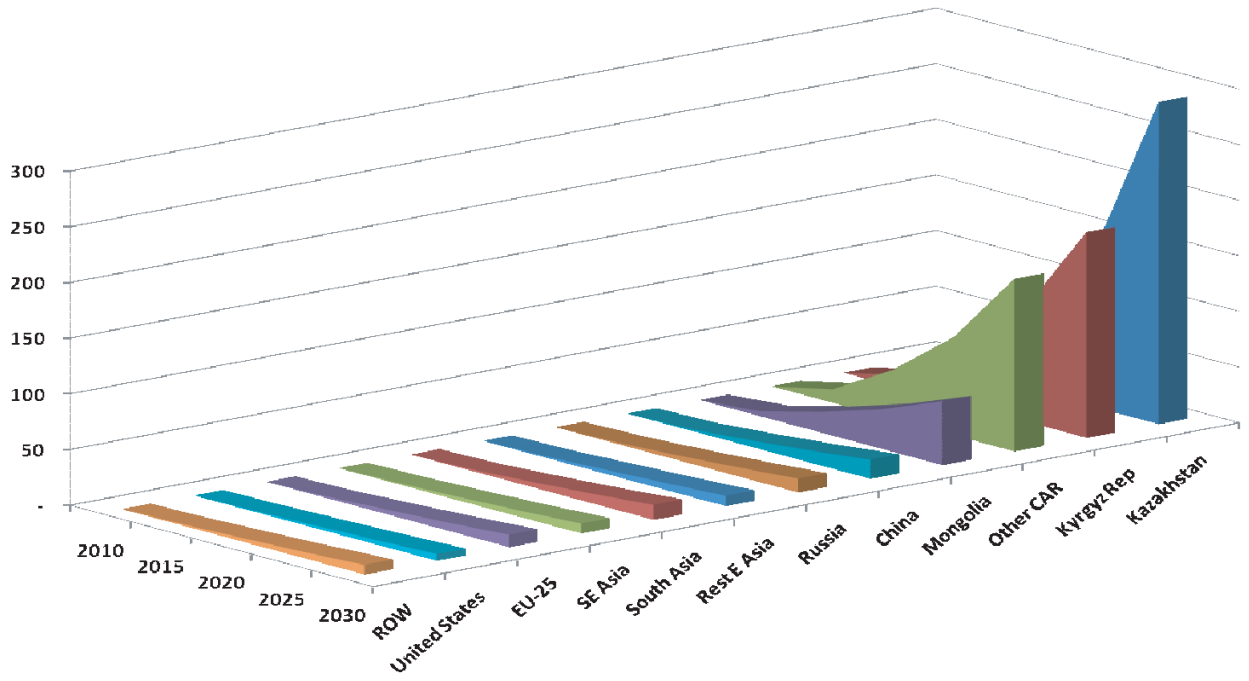

FIGURE 2 Real GDP growth (annual percentage change from 2010 baseline) (ROW = rest of world, EU-25 = European Union countries, SE Asia = Southeast Asia, CAR = Central Asian Republics).

income gains accrue to larger economies, suggesting a broader basis for financing and policy support.

Table 3 shows how real GDP increased by 2030 as a result of the project, separating the total benefit for each economy into each of the four sources of stimulus (i.e., Scenarios 1–4). These results clearly indicate the importance of indirect project effects. Direct or Keynesian effects (isolated in the VOC scenario) are negligible for Kazakhstan's trading partners because this is a national project, yet these partners benefit significantly from linkages of their economies through the corridor.

Even in Kazakhstan, which captures all the Keynesian and other direct project benefits (VOC scenario), the indirect effects are about 10 times greater because the efficiency benefits of improved transport propagate across all market-related activities in the economy. Indeed, higher productivity from transport and distribution services (Prod scenario) make up the largest component of project-induced growth. Although neoclassical effects dominate the growth stimulus, trade and product distribution efficiency are also significant sources of growth advantage.

Given the dominance of indirect effects among infrastructure's contributions to the growth and wider development process, it is reasonable to argue that project finance and assessment are seriously incomplete without accounting for these benefits. The direct project impacts (the Keynesian impacts minus VOC savings) represent less than 1% of the overall gains for the country hosting the project, and none of those (in some cases significant) impacts accrue to neighbors

TABLE 2 Real GDP Growth, Annual Percentage Change from 2010 Baseline

Country	2015	2020	2025	2030
Kazakhstan	17	68	148	290
Kyrgyz Republic	13	50	103	185
Other Central Asian countries	12	44	88	155
Mongolia	5	19	36	57
China	1	6	11	17
Russia	1	4	8	12
Rest of East Asia	1	4	6	9
South Asia	1	5	9	13
Southeast Asia	1	3	6	9
EU-25	1	4	7	11
United States	1	2	4	6
Rest of the world	1	3	6	8

TABLE 3 Average Annual Real GDP Growth Premium in 2030, Percentage Change from 2010 Baseline

Country	VOC	Productivity	Losses	Trade
Kazakhstan	0.61	3.39	2.64	2.19
Kyrgyz Republic	0	3.41	2.09	1.38
Other Central Asian countries	0	2.57	1.68	1.14
Mongolia	0	1.51	1.04	0.06
China	0	0.56	0.34	0.27
Russia	0	0.33	0.21	0.15
Rest of East Asia	0	0.24	0.15	0.11
South Asia	0	0.36	0.29	0.18
Southeast Asia	0	0.29	0.16	0.1
EU-25	0	0.42	0.24	0.19
United States	0	0.15	0.09	0.35
Rest of the world	0	0.40	0.27	0.19

and more distant trade partners. It would be much easier to sustain constructive multilateral dialogue with evidence of this kind, in no small part because investments of this type often lead to unilateral competition for scarce multilateral resources.

While productivity effects represent a significant stimulus to aggregate growth, they are even more important to real output. Cost factors in trade and transport confer profitability and enlarge marketable horizons for intermediaries, which in turn stimulate final and intermediate demands. Productivity growth, however, increases supply elasticities and accelerates the responsiveness of domestic producers to these opportunities. Demand expansion without productivity growth would be significantly dissipated in price escalation, but productivity benefits enable producers to meet rising demand with higher real output.

Figure 3 shows detailed output effects of the project by country and sector. These results are presented in relative terms, as a multiple of baseline values in 2030. As seen with GDP (Table 3), the project has a dramatic effect on Kazakhstan and its immediate neighbors. Because trade and distribution services are such a pervasive cost component across the economy, the effects for the host and proximate economies are relatively uniform. The growth effect is slightly higher in massive, low-value products such as agriculture and heavy industry and is lower in less transport-intensive services.

For more distant economies, the percentage growth effects are understandably smaller, but they are also less uniform. This is because they depend not only on proximity but on induced trade flows and thus patterns of comparative advantage. Thus, benefits to the European Union and United States are larger in the services and food processing sectors but are lower in agriculture and other primary sectors.

When these results are shown in nominal terms, the effects vary more strongly between countries but less so between sectors. Here, it can be seen that both the European Union and the United States receive very large income gains from service linkages to Kazakhstan and all the other parties that experience project-induced growth. This increase is a combined result of linkage through financial services, joint venture management, and other commercial contracting.

Results for Kazakhstan households are consistent with aggregate indicators, but the scenario components contribute in different ways (Table 4). In particular, the trade component is more important to households than to firms because the project improves international market access, both in terms of product variety and prices. Greater import competition also disciplines domestic prices, further enhancing domestic purchasing power.

Table 5 recasts some of the key results (Table 3), focusing on estimated impacts on the target sectors for the project, trade, and transport, including both direct and indirect effects. For comparison, output and trade statistics for the Kazakhstan transport and distribution sectors are presented for the baseline (2010) situation and without the project in 2020.

The following gives 2020 statistic with the project:

- Output: 137,520,
- Exports: 8,857, and
- Imports: 2,546.

The output variable measures the total value of transport and distribution services provided, while imports and exports measure the value of these services provided to and from foreign markets, respectively. For example, without the project, output of the transport and distribution sectors rises from $56,333 million to $76,664 million from 2010 to 2020. With the project, the latter figure nearly doubles, reaching $137,560 million.

All these results are intuitive and consistent with those at the macro level (Table 3), but a few detailed points are of interest. Compared

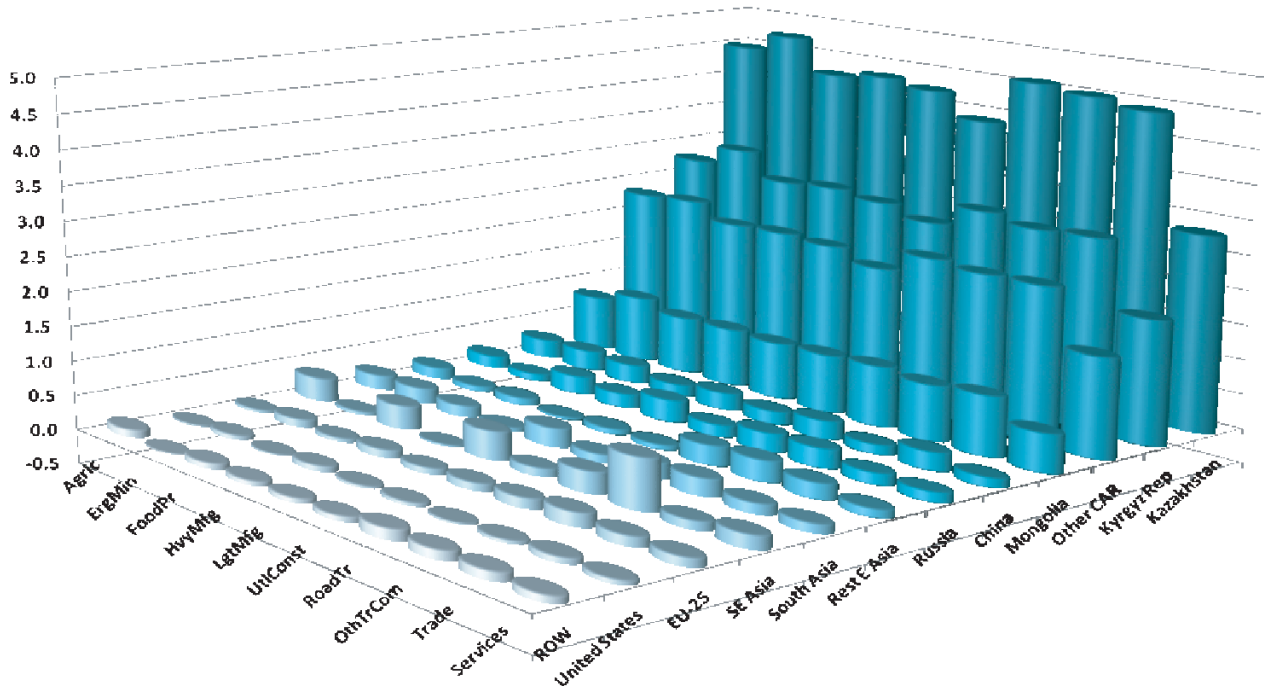

FIGURE 3 Sector output growth in 2030 (percentage change from 2010 baseline) (Agric = agriculture, ErgMin = energy and mining, FoodPr = food processing, HvyMfg = heavy manufacturing, LgtMfg = light manufacturing, UtlConst = utility and construction, RoadTr = road transport, OthTrCom = other transport and communications).

TABLE 4 Real Household Income Growth in 2030, Percentage Change from 2010 Baseline

Country	VOC	Productivity	Losses	Trade
Kazakhstan	0.2	1.74	2.45	3.26
Kyrgyz Republic	0	1.57	1.67	1.64
Other Central Asian countries	0	1.10	1.09	1.01
Mongolia	0	0.59	0.54	0.43
China	0	0.15	0.11	0.08
Russia	0	0.11	0.08	0.05
Rest East Asia	0	0.08	0.06	0.03
South Asia	0	0.10	0.09	0.06
Southeast Asia	0	0.09	0.06	0.03
EU-25	0	0.14	0.09	0.07
United States	0	0.04	0.03	0.10
Rest of the world	0	0.13	0.09	0.06

TABLE 6 Growth Premium 2010 to 2020, Percentage Change in Total Output

Sector	Baseline	Project	Difference
Agriculture	41	156	116
Energy and minerals	38	145	108
Food processing	47	157	110
Heavy manufacturing	41	145	105
Light manufacturing	44	148	104
Utility and construction	49	153	104
Road transportation	42	158	115
Other transport and communications	47	159	112
Trade	46	159	113
Services	49	124	75
Total	44	148	104

with preproject activity, the project adds 61% to total trade and transport activity in the country by 2020, including growth along the corridor and induced trade and transport from feeder road, rail, and other systems. With respect to 2020, the corridor increases national trade and transport activity by 44%.

Also noteworthy is how the project confers comparative advantage on Kazakhstan and, by extension, other export sectors. By 2020, exported trade and transport services have grown 39%, whereas imported trade and transport services have risen only 18%. The difference in competitiveness, reflected in superior investment and growth opportunities for Kazakhstan trade and transport, is reflected in the higher domestic output figure (44%).

Table 6 gives sectoral growth results for the project, indicating that the economywide output would be 104% higher by 2020 but that the individual sectors will benefit to a different extent. The agriculture sector benefits more than average because reduced perishability and increased market access are more important to this sector. Services, being less tradable, still benefit significantly, but less so.

TABLE 5 Kazakhstan Trade and Transport Sector Growth, 2010 Dollars, in Millions

Baseline	2010	2020
Output	53,333	76,664
Exports	3,873	5,429
Imports	1,481	2,076
Change		
Output	84,226	60,895
Exports	4,984	3,427
Imports	1,065	470
Percent		
Output	61	44
Exports	56	39
Imports	42	18

CONCLUSIONS

This report presents results from a multicountry general equilibrium assessment of a large road corridor project in Kazakhstan. The approach is particularly suited to estimating the direct and extensive indirect effects of the project. The results show that the overall benefits of the project far outweigh the project costs. In addition to the positive and significant direct effect of the project, the transboundary spillover confers significant growth leverage to the neighboring and regional economies and can even substantially benefit more distant trading partners.

In comparison, the direct project benefits are relatively small compared to productivity, efficiency, and trade stimulus effects. Productivity gains are the largest source of growth benefits, but reduced losses and trade stimulus are of nearly equal benefit. Trade benefits help the overall economies and extend far beyond the borders of Kazakhstan to large but distant trading partners like the European Union and the United States. Trade margin reductions also increase domestic purchasing power and household real incomes and therefore increase household welfare status (*20, 21*). The project thus positively affects both the overall economy and individual households, suggesting strong support for the project (*22*).

Moreover, as has been demonstrated, estimations of different components of the project's indirect effects are necessary for a comprehensive impact evaluation in general and for sustaining policy dialogue across countries in the region and beyond to improve regional integration, especially in the areas of trade and infrastructure. Application of this type of modeling approach is also desirable for other sectors such as energy and for other cross-border issues and projects.

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