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Improved Infrastructure and Central Asian Exports of Agricultural Commodities

Richard Pomfret

School of Economics, University of Adelaide
(Adjunct Professor Johns Hopkins Bologna Center)

richard.pomfret@adelaide.edu.au

To be presented at the conference "Regional and International Cooperation in
Central Asia and South Caucasus: Recent Developments in Agricultural Trade"
to be held from 2 to 5 November 2016 in Samarkand, Uzbekistan.



Outline of Presentation

1. high trade costs limit trade and economic diversification in CA
 - especially onerous for SMEs, including farmers producing fruit and vegetables and niche products.
2. high trade costs are not immutable
 - CA is landlocked, but also land-linked to large and growing economies.
3. example of lower trade costs → new agricultural exports
4. connectivity is being improved in and around CA
 - Eurasian landbridges (PRC-EU rail services)
 - the Eurasian Economic Union, China's Silk Road Economic Belt, Iran's reintegration into the global economy, etc.
5. International evidence on the link between infrastructure & agricultural development and diversification
6. Conclusions
 - Transport infrastructure can stimulate agricultural development
 - whether 2017 is a window of opportunity or a missed opportunity depends on willingness of CA governments to be proactive in ↓ trade costs

The Legacy – the Central Asian Republics

Open economies, but trade concentrated within the USSR

- all transport links led North to Russia
- Role in USSR = supplier of raw materials – cotton, minerals, primary energy

After independence:

- nationalization of transport networks
- exports reoriented to global economy (cotton, oil&gas, minerals)
- desire for economic diversification, but limited progress
 - related to high trade costs
 - many integration proposals, but reality = regional economic disintegration

Why are Trade Costs High in CA?

Geography – landlocked countries, with poor inherited connectivity in all directions except North.

- but high trade costs reflect poor hard and soft infrastructure (not just geography)
- The role of trade costs was highlighted by:
 - UNDP (2005): *Central Asia Human Development Report: Bringing Down Barriers: Regional cooperation for human development and human security* (United Nations Development Programme: Bratislava).
 - ADB (2006): *Central Asia: Increasing Gains from Trade through Regional Cooperation in Trade Policy, Transport and Customs Transit* (Asian Development Bank: Manila).

Alternative view: the geographical location is potentially favourable (Figure on next slide from Linn 2004)

Is Central Asia punished by landlockedness or blessed by a dynamic neighborhood?



How High are Trade Costs in Central Asia?

Many anecdotes of high trade costs, but little systematic information before the 2010s

- World Bank *Doing Business* data - widely cited, but especially problematic for Central Asia
 - based on perceptions rather than actual trade costs
 - reports cost of shipping a container from a country's main commercial centre
- Since 2010 the *Corridor Performance Measurement and Monitoring* program administered by CAREC provides a better picture

CAREC Corridor Performance Measurement and Monitoring (CPMM)*

provides a detailed picture of the difficulties of conducting overland trade in Central Asia

(CPMM) methodology based on the time-cost-distance method developed by UN-ESCAP.

- in contrast to earlier studies of *ad hoc* trips, CAREC's measurement consists of regular monitoring in conjunction with the freight forwarder associations.
- ***the overall picture is that, even when the physical infrastructure is good, journeys are slow and costly with especially long delays at border crossing posts***

* CPMM Annual Reports are available at www.cfca.net 2015 sample = 2,784 trips, along the six corridors monitored by CAREC, of which 75% were by road 25% by rail,

Average Border Crossing Time in Hours, inbound traffic, selected BCPs [Source: CPMM, 2015, 42-3]

	from-to	2010	2011	2012	2013	2014	2015
Road							
Khorgos	PRC/KAZ	16.0	12.7	17.3	11.2	6.8	5.8
Tazhen	UZB/KAZ	9.7	10.3	12.5	8.6	7.8	7.8
Konysbayeva	UZB/KAZ	8.2	8.7	7.8	6.8	7.5	7.5
Chaldovar	KAZ/KRG	36.9	5.1	4.9	6.6	6.5	6.5
Irkeshtam	PRC/KRG	4.5	12.0	9.9	7.2	6.1	5.2
Dusti	AFG/TAJ	8.7	5.4	4.6	5.3	5.8	5.8
Karamyk	KRG/TAJ	na	3.9	3.6	1.9	2.3	4.7
Fotehobod	UZB/TAJ	8.0	4.8	4.4	5.1	6.6	7.1
Sarah	IRN/TKM	6.4	6.5	10.5	8.8	6.1	6.1
Farap	UZB/TKM	8.6	7.8	8.5	6.6	7.3	7.1
Alat	TKM/UZB	3.7	5.3	5.8	4.6	5.3	5.4
Dautota	KAZ/UZB	3.9	4.8	12.8	6.1	5.8	5.9
Rail							
Altynkol	PRC/KAZ				4.5	37.4	na
Dostyk	PRC/KAZ	34.5	43.6	28.3	64.8	59.7	42.3
Farap	UZB/TKM				14.5	14.9	4.7
Keles	KAZ/UZB				4.9	0.8	5.7

Example from E40 (Tashkent-Brussels road)



By 2012 the Nukus - Beyneu road had been upgraded, so that speeds of 100kph are possible in parts and 60kph on most of it - a big improvement over 2007 (left)

BUT in 2012 crossing the border crossing took on average 30 hours at the Kazakhstan border post and 14 hours at the Uzbekistan border post (CPMM, 2012, 24).

Delays have not been reduced much since monitoring began in 2009/10

General pattern = improvements in the physical infrastructure, but inadequate attention paid to trade facilitation

longest delays are on the corridor with the highest volume of freight, the China-Kazakhstan railway

Exception:

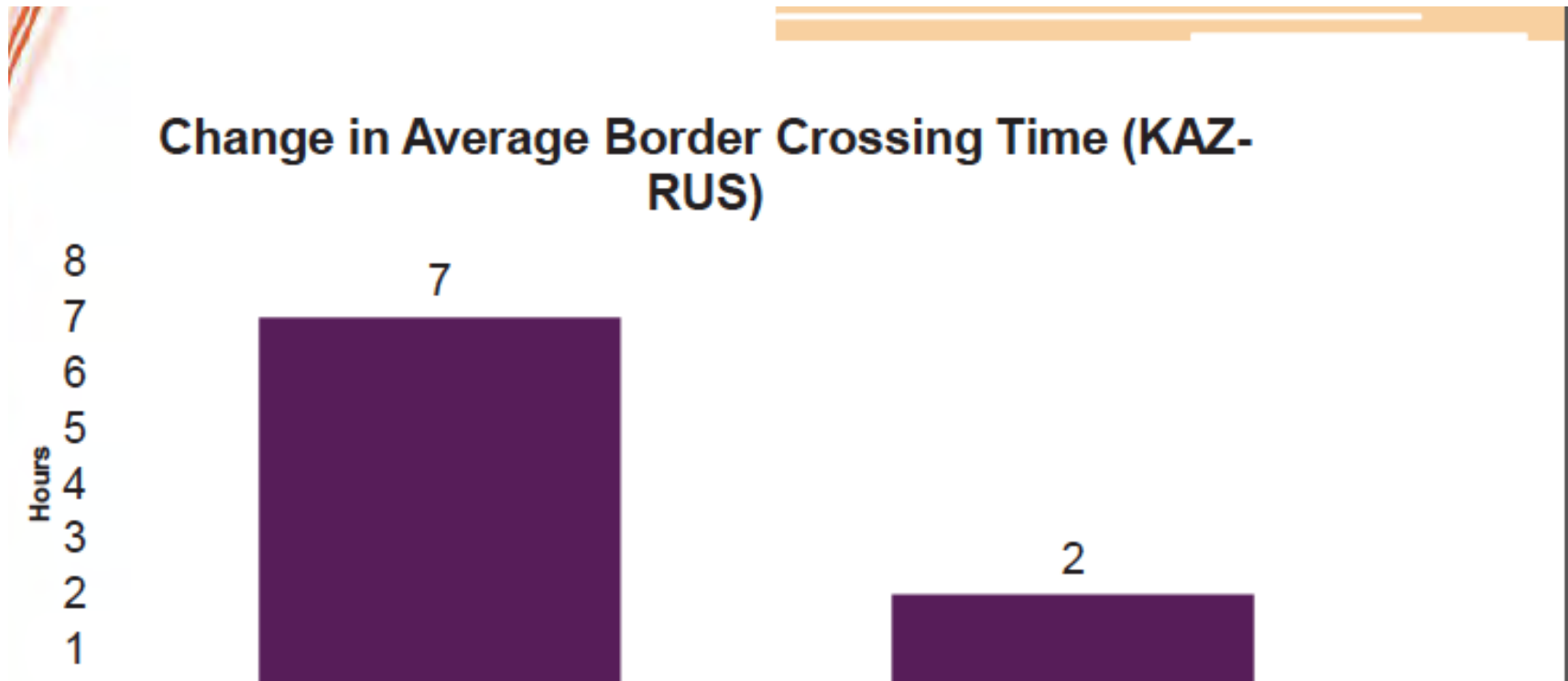
- the Chongqing-Duisburg train has special wagons to facilitate the gauge change and is subject to simpler border formalities.

The other big exception to the general pattern:

- delays at borders between Russia and Kazakhstan have shortened since the establishment of the customs union.

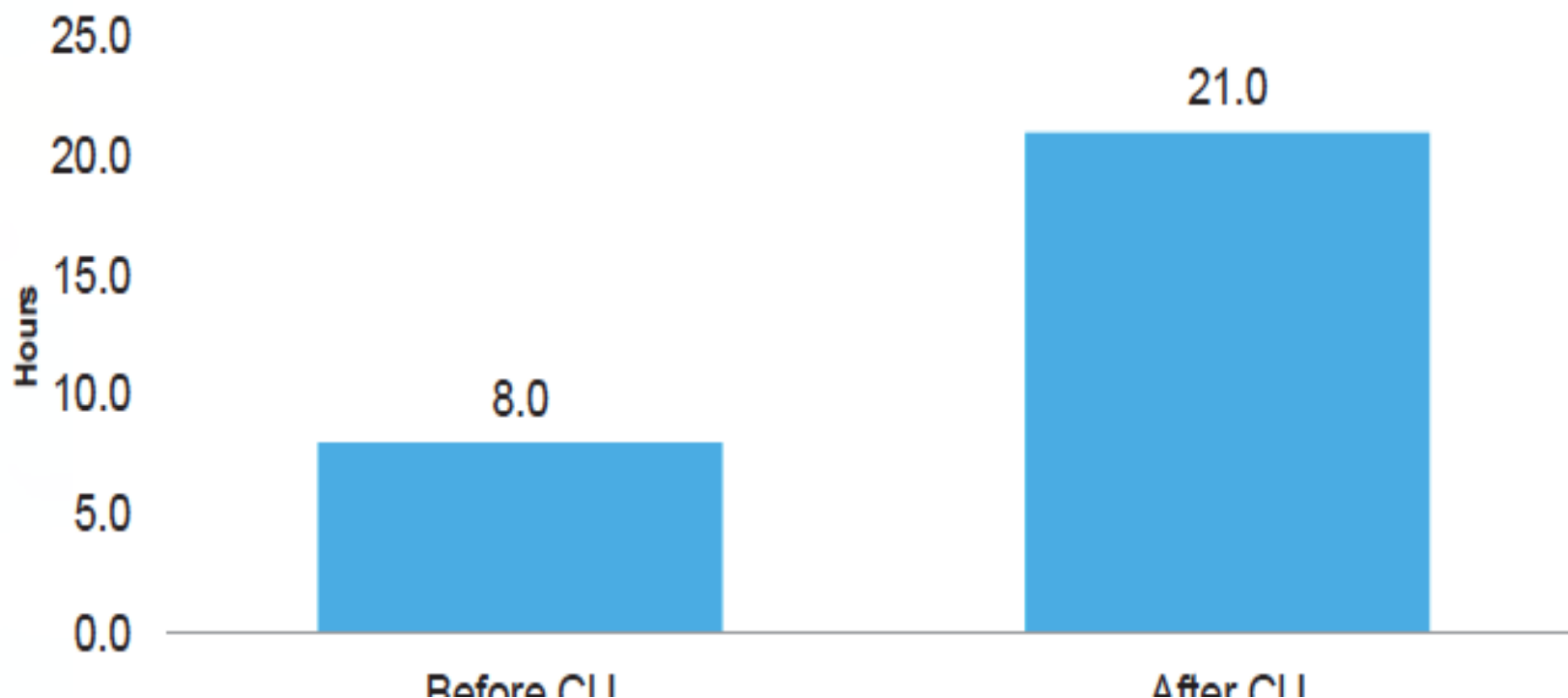
Governments could facilitate trade, but the political will to do so for intra-Central-Asian trade has been lacking.

Comparison: Before/after CU



Comparison: Before/after CU

Change in Average Border Crossing Time (Non CU to KAZ)



Other Trade Facilitation Issues

corruption is still prevalent at many Central Asian borders

- a 30-35% chance that “unofficial payments” would be demanded at border crossing points

uncertainty

- large variation in trade costs (money & time) not only between border crossing points, but at different times
- uncertainty of access to infrastructure, e.g. elevators or railcars (OECD 2013 report on agriculture in Kazakhstan)
- uncertainty of market access for non-WTO countries (e.g. AD duties against Kazakhstan’s wheat before 2015 WTO accession)

Trade Costs and Agriculture

Trade costs especially hurt SMEs, including farms.

- traditional crops (cotton, and wheat from northern Kazakhstan) are exported despite high trade costs,
- But, although many policy advisers identify fruit & vegetables & niche exports as areas of potential comparative advantage, they have been deterred by high trade costs:

Anecdotal evidence (tragedy of the anti-commons)

- onion export from the Kyrgyz Republic to Siberia
- other farm exports from Tashkent to Siberia

Once destroyed, the trade may be harder to restore.



3. Case Studies

Trade costs are high

- but where it is easier to do business, participation in international value chains is possible

few examples of Central Asian producers being involved, and these involve the Kyrgyz Republic.

during the 1990s the Kyrgyz Republic adopted the most open economic system in Central Asia, and in 1998 became the first Soviet successor state to join the WTO.

One consequence = the Kyrgyz Republic became the entrepôt through which consumer goods entered the region; during the 2000s the country's bazaars became major trading hubs.

Dordoy (Bishkek)



Development Impact of Dordoy*

- Labor-intensive – creates jobs
 - Dordoy >55,000 in 2008 -- pro-poor growth
- Value-added contributes to GDP
 - note unlikely to be measured accurately
- Transport networks → spillover effects
 - e.g. rapid growth since the early 2000s of an export-oriented clothing industry located primarily in Bishkek
 - employs >100,000; uses imported inputs purchased at Dordoy; exports to Kazakhstan & Russia.

* Data from World Bank survey in 2008



An Agricultural Export: Beans*

- bean production in Talas oblast increased from 5,000 hectares in 1999 to 45,000 hectares in 2012
- small-scale farmers became competitive producers, supplying export markets in Turkey, Bulgaria and Russia.
- households specializing in beans became significantly better off than non-bean-producers in Talas
 - Tilekeyev (2013) using May-June 2011 household survey data.

* Kanat Tilekeyev: Productivity Implications of Participation in Export Activities: The case of farmers in Talas Oblast of Kyrgyzstan, *Institute of Public Policy and Administration, Working Paper No.17*, University of Central Asia, Bishkek, 2013.

Kyrgyz Republic







Determinants of Beans Value Chain

1. geography

- bean production is concentrated in two of the four rayons in Talas oblast that are well-suited to growing beans.

2. infrastructure

- better road to Bishkek developed in the 1990s

3. technology transfer

- introduction of new bean varieties, primarily from Turkey
- degree of policy certainty related to WTO membership and liberal trade policies surely helped
- 2 and 3 reflect lower trade costs, also access to inputs at Dordoy or imported from China



Not only farmers benefit – many SMEs offer intermediary services.

Several local companies imported cleaning equipment, and they

- hand clean of grain and other admixtures.
- clean kidney beans on machines
- calibrate kidney beans by sizes: 6–7mm; 8mm; 9mm+
- pack in new 25kg and 50 kg polypropylene bags.
- store beans and ship them to buyers and customers.

an active web-based market in transport services to Europe, Russia and China emerged quickly.

By 2011 bean production generated employment for 162,000 people (Talas oblast pop. c.220,000!)



Policy Implications

The Talas beans case study is revealing, insofar as it involved many aspects (geographical suitability, technology transfer, processing, identifying export markets, transport & logistics, etc)

- and yet the bean value chain was unplanned by the national or local government.

What the Kyrgyz government did provide was

- a facilitating environment (land reform, WTO membership, etc.)
- improved infrastructure (roads, and web connectivity)

that was lacking elsewhere in Central Asia.

Conclusions

Promotion of agricultural diversification is multi-faceted, requiring change not only in production but also beyond the farm-gate.

- details will vary by crop and location, perhaps dependent on specific institutional setting, but in general terms the costs of doing business matter and, if the product is to be internationally competitive, trade costs are crucial.
- rural roads have been highlighted in recent development literature, but in other cases rail or air connections may be important.
- technology transfer may be important at the farm-level – and beyond the farm gate
- intermediaries may also be important, and their efficiency may be dependent on access to best-practice equipment.

4. Connectivity is being improved

Improvements in hard infrastructure, and signs of willingness to cooperate:

- TKM-UZB-KAZ-PRC gas pipeline built 2006-9
- Road & rail improvements
 - domestic networks, including high-speed rail links (Tashkent-Samarkand, Almaty-Astana)
 - establishment of regular rail service Chongqing-Duisburg – currently three times a week
 - Kazakhstan-Turkmenistan-Iran railway completed 2014
 - Reintegration of Iran into the global economy
 - China-Pakistan economic corridor (Karakoram Highway)

Many Projects and Proposals

- Eurasian Economic Union
 - eliminating tariffs & reducing trade costs among RF, BEL, KAZ, ARM, KRG
- China's Silk Road Economic Belt and Asian Infrastructure Investment Bank

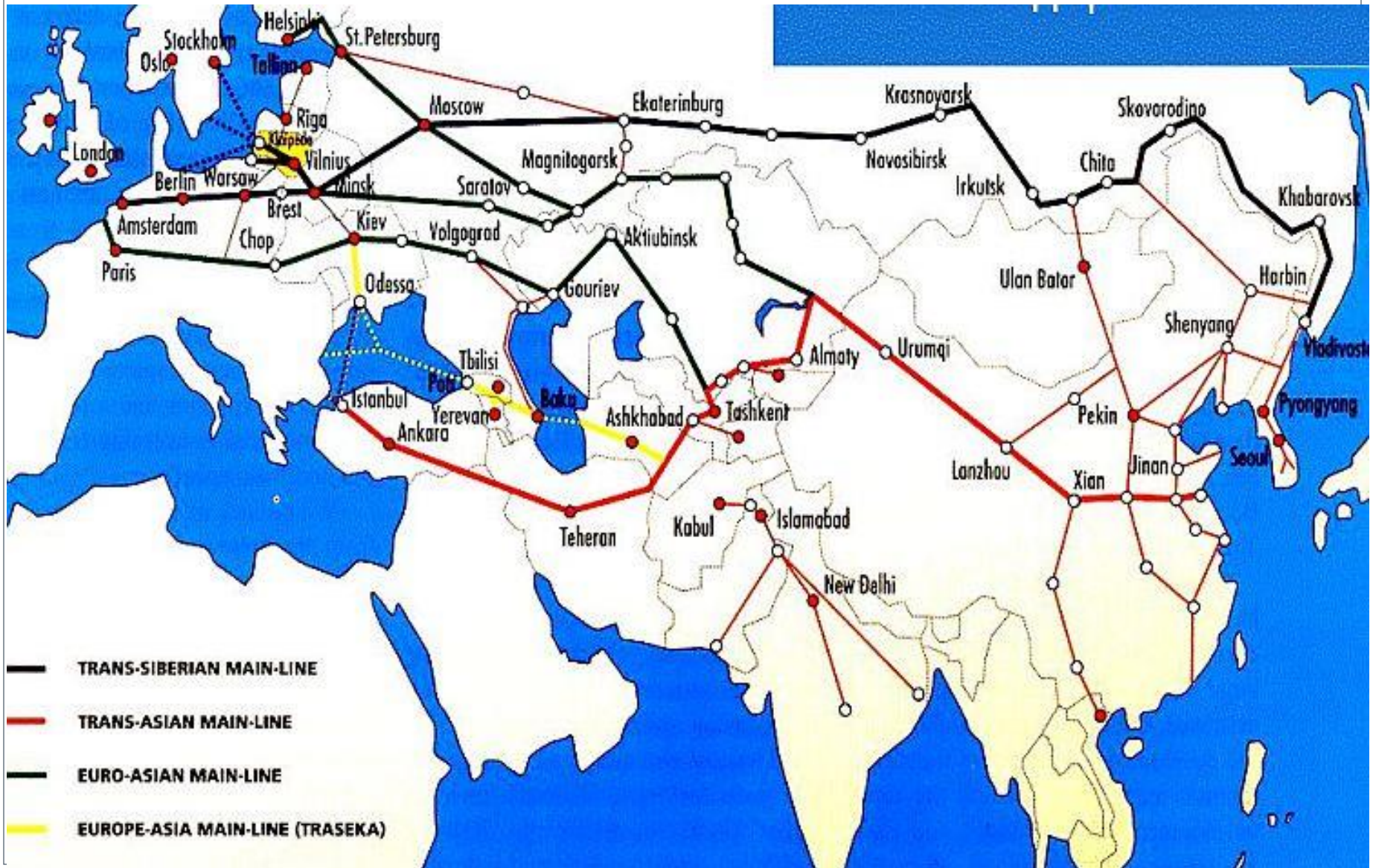
Others less important

- EU – TRACECA (TransCaspian), BOMCA, Strategy for CA
- USA – Northern Distribution Network & New Silk Road (focus on AfPak links)
- Japan, India, Korea, etc

Eurasian Landbridges

1. The Trans Siberian Railway
2. The Chongqing-Duisburg service (PRC-Kaz-RF-Bel-Pol)
3. TransCaspian
 - Turkmenbashi-Baku (TRACECA)
 - Aktau-Baku – linking to Baku-Tbilisi-Kars railway to Turkey (tbc in 2017).
4. China-Iran – first train reached Tehran early in 2016
5. Connecting to South Asia
 - Afghanistan routes are slow, & security issues remain
 - Kashgar/Kashi and Karakoram Highway to Pakistan
 - Iranian rail and Chabahar-Mumbai to India

Choice of routes is good, but mutually exclusive projects (e.g. a PRC-EU high-speed rail link) have potential for conflict




The New Silk Road railway.



Source: Xinhua News Agency, May 2014

Benefits of Competition for Agriculture Trade Routes

- Development of alternative market outlets, e.g. for KAZ grain (rail to Iran)
- Potential for new niche products as trade costs fall
 - NB speed and reliability matter as well as money cost
- Competition for routes may be an incentive to improve soft infrastructure and cooperate
 - e.g. Green Corridors  – operational Kaz-PRC (goal of <1 hour at the BCP by end of 2016) – negotiating KRG-PRC, TAJ-PRC, KAZ-Azerbaijan



High Speed Trains

- Chinese proposals for a high-speed rail service that would link China to the EU in two days are not implausible given the speed with which China has constructed its domestic high-speed rail network.
 - On the Lanzhou-Urumqi high-speed line, completed in 2014, the 1,776-kilometer journey takes ten hours.
 - The train journey from Urumqi to the Kazakhstan border is 460 kms.
- An effective rail link from China to Tehran and Istanbul has major implications for the Central Asian countries.
 - One attraction would be to encourage agricultural trade based on the differences in comparative advantage along the railway route.
 - Such trade would require not only the hard infrastructure of fast train lines, but also the soft infrastructure to facilitate trade.
- due to expense only one route is likely – N or S of Caspian

Lan-Xin rail (兰新高铁)



Prospects for Agricultural Trade along a New Silk Road

a well-functioning Silk Road Economic Belt would allow efficient specialization and trade among the countries from the EU, Middle East and North/East Africa to China.

- especially important for agriculture because the variation in geographical conditions can support production of a variety of agricultural products and because reliable rail service is well-suited to handling perishable goods.
 - air freight services offer faster delivery but are typically too expensive for any but the most highly demanded niche agricultural products or delivery to high-income countries
 - maritime transport is cheaper but slower, and almost always has to be part of a multimodal network.
 - Rail is well-suited to providing reliable service among land-linked countries. The vision of high-speed trains(>200 kilometers per hour) for freight, holds huge promise for linking East and Central Asia to the Middle East and Europe, and promoting agricultural production and trade across those countries.

Agricultural Trade along the Silk Road



In the Silk Road's prime melons from today's Uzbekistan were highly prized in Baghdad and Damascus. Other cultivated crops, such as grapes, peaches, vegetables, spices and sugar enhanced their geographic distribution with the help of silk road merchants.

The Silk Road Economic Belt could revive such mutually beneficially trade in agricultural products as long as the hard and soft infrastructure were improved.

5. Evidence on Infrastructure and Economic Growth and Agricultural Development

How strong is the link between improved hard (and soft) infrastructure and agricultural development?

- Limited current evidence, but the original Russian rail-building (after 1865) and Soviet rail-building (the TurkSib) impacted on agricultural specialization and trade
- Other historical case studies
 - massive rail-building in British India up to 1930 → ↑ economic growth & agricultural development in districts served by rail (Donaldson AER forthcoming)
 - similar evidence for 19th century USA and for China since 1980s

World Development Report 2009 - "Reshaping Economic Geography"

Why is assessment of infrastructure so hard?

- difficult to measure “infrastructure”: how to aggregate sea ports, airports, paved and unpaved roads, railways, river systems, multimodal?
 - and these are all of limited value without soft infrastructure
- not all transport infrastructure is equal; transport networks may have key links and redundant links
- many channels to affect development & relative importance varies
 - Market integration, spread of ideas, labour mobility. improved access to social services such as health and education, etc
 - Importance depends on nature of local economy, e.g. transport of perishable goods in refrigerated trucks often uneconomic on unpaved roads
- endogeneity – does transport infrastructure improvement follow prosperity? Case studies seek exogenous building.

Gravity Model Studies I

A series of World Bank studies use the GM to link trade facilitation or infrastructure/measures to bilateral trade flows

- Portugal-Perez and Wilson (2012) used a GM to identify the impact on trade of indicators of hard and soft infrastructure in 101 countries over the period 2004-7.
 - physical infrastructure and the business environment had the largest positive impact on bilateral trade flows;
 - border efficiency and the business environment were more important at lower per capita GDP levels and ICT and physical infrastructure increasingly important as per capita GDP increased.

This result supports the focus on trade facilitation in the low- and middle-income countries of Central Asia, as well as Kazakhstan's increased focus on hard infrastructure since 2014.

Gravity Model Studies II

Portugal-Perez and Wilson (2012) also found

- evidence of complementarity between hard and soft infrastructure,
- weaker evidence that investment in physical infrastructure impacts more on extensive than on intensive growth.
 - providing some support for the prospect of improved connectivity promoting economic diversification and inclusive growth in Central Asia.

In sum, the cross-country analysis yields plausible results confirming most prior expectations, but the GM studies depend on datasets that are mainly perception-based (Doing Business, Global Competitiveness Report, Transparency International).

What are the Benefits of Better Transport?

- Market integration - not only raises incomes but also reduces volatility by moderating demand-supply imbalances, e.g. due to a poor harvest (Sen and Drèze on famines).
- railways may have further benefits including
 - enabling transport of perishable goods,
 - facilitating access to inputs and participation in global value chains,
 - stimulating technical transfer through the spread of ideas,
 - increasing labour mobility.
- In rural areas, better transport can improve access to social services such as health and education, although that is typically associated with road rather than rail.

Some studies conclude that the main positive consequence of transport improvements = agglomeration (survey by Glaeser & Gottlieb, JEL, 2009)

- Atack, et al (2009 *NBER Working Paper 14,640*), on US railroads
- Michaels (REStats, 2008) and Duranton, Morrow and Turner, REStuds, 2014) on US interstate highway system
- emphasize the geographical dimension, i.e. the relocation of economic activity due to transport improvements which yields agglomeration benefits but may also impoverish those left behind
- Similar story in connection with Chinese rail (Banerjee et al.) & trunk roads (Faber, 2014)

Conclusions from the Economics Literature

The literature, although subject to many methodological caveats, consistently supports the hypothesis that improved infrastructure is positively related to increased trade, diversification and growth.

- The strongest evidence is for a market integration link (i.e. better matching of buyers & sellers), which is especially convincing for the nineteenth-century agrarian economies of the western USA or India, and is readily applicable to present-day Central Asia.
- An important conclusion from more recent episodes is the importance of the infrastructure-growth link via labour movements which promote agglomeration benefits but can create losers as well as winners;
 - the losers tend to be people stranded in depressed regions.
 - In Central Asia, reduced transport costs could exacerbate the already strong incentive for migrant labour, with the extent of impoverishment in the sending regions depending upon the flow of remittances and other costs and benefits.

Conclusions from CA – high trade costs hamper economic diversification & economic development

- Exports from Central Asia remain concentrated in a small number of primary products, despite governments' stated goal of diversification.
- Legacy and geography were unfavourable, but
 - governments made little effort in the 1990s to reduce the costs of international trade
 - and the region was characterized by economic disintegration until the end of the 2000s.
- High trade costs have impacted especially negatively on small and medium-sized enterprises, including farms with potential comparative advantage in fruit or vegetables or niche products.
- A harbinger of regional cooperation was the Turkmenistan-Uzbekistan-Kazakhstan-Xinjiang gas pipeline built between 2006 and 2009 -- a win-win project for all Central Asian participants.
- More generally, in the twenty-first century the hard infrastructure of roads, railways, pipelines and airports has improved in Central Asia, but use of the improved infrastructure for international trade has been discouraged by high trade costs.

A Window of Opportunity in 2017?

Many positive signs that the situation is changing.

- China's rapidly growing economic involvement in CA since 2000, and announcement of the potentially well-funded Silk Road Economic Belt,
 - Iran's reincorporation into the global economy + prospects of stability in Afghanistan could introduce further vectors into CA's international economic relations.
 - the EEU = the first significant example of a regional trade agreement being implemented in CA since 1991.
- and that CA could become “land-linked”.

The extent to which these potential changes and investment in hard infrastructure promote trade and agricultural development will depend crucially on domestic ease of doing business and on improved soft infrastructure for international trade.



Contact

Thank you for your attention!

Any comments, questions, suggestions, please e-mail.

richard.pomfret@adelaide.edu.au

Upon request I will send a background paper with more details and references