Impacts of the Patterns of Financing on Logistic Infrastructure in CAREC Member Countries

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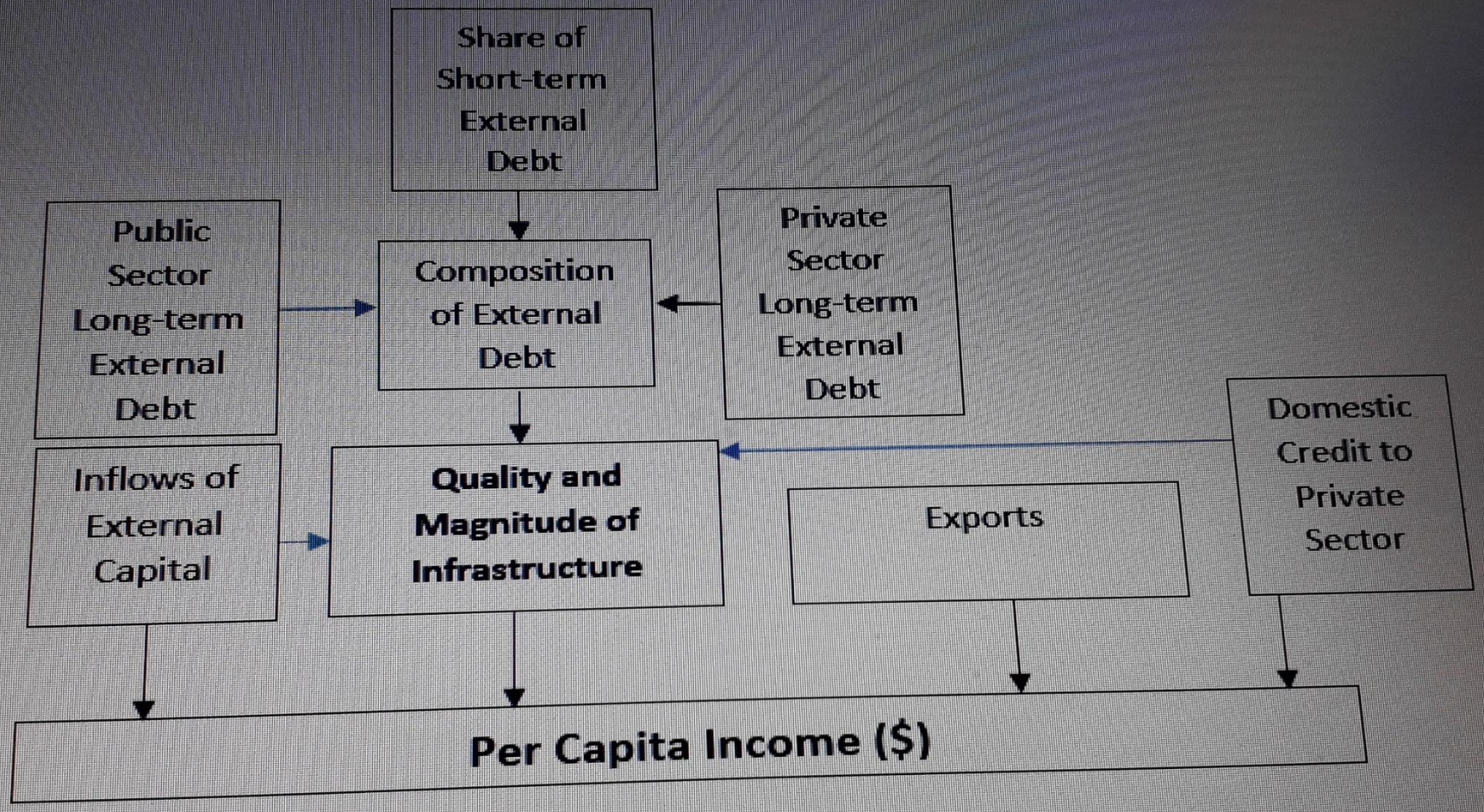
Simultaneity in the Model



Dependent Variable: Logistic Infrastructure- Overall Index (LGSTALL)

Panel Least Squares
Periods included: 5; Cross-sections included: 109;
Total (Unbalanced) observations: 486
Sample: 2007-2016

Explanatory Variable	Model: I		Model: II		Model: III		Model: IV	
	β	T	β	T	β	T	β	T
Constant	2.312	114.400***	2.325	118.143***	2.311	119.023***	2.299	112.142**
CAREC	-0.125	-2.981***	-0.090	-2.072**	-0.106	-2.462**	-0.1069	-2.532**
DCPSGDP	0.005	9.563***	0.006	13.321***	0.006	13.736***	0.005	9.853***
DBTLT	1.56E-12	9.855***					0.003	2.948***
DBTST	0.004	3.240***						
BNDPN			-2.06E-11	-1.876*	-2.18E-11	-1.951*	-2.73E-11	-2.334**
DBTLTPB			3.93E-12	7.213***	4.03E-12	7.318***	3.58E-12	6.370***
DBTLTPV			3.26E-13	0.759	4.04E-13	0.943	7.32E-13	1.691*
FDI$			-5.07E-13	-0.616				
Adjusted R^2	0.4634		0.4982		0.4955		0.4783	
F-statistic	102.4676		77.9586		96.2682		72.8094	
AIC	0.1384		0.1136		0.15258		0.1145	
Schwarz Crit.	0.1825		0.1759		0.2043		0.1762	
H-Q Criterion	0.1558		0.1381		0.1729		0.1388	
D-W Statistic	0.9157		0.9413		0.91406		0.9108	

'β' indicates Coefficient; 'T' indicates T-Statistics
*p < 0.1; **p < 0.05; ***p < 0.01

Dependent Variable: Quality of Logistic Infrastructure (LGSTQLTY)

Panel Least Squares
Periods included: 5; Cross-sections included: 109;
Total (Unbalanced) observations: 486
Sample: 2007-2016

Explanatory Variable	Model: I		Model: II		Model: III		Model: IV	
	β	T	B	T	β	T	β	T
Constant	2.245	96.123***	2.260	98.995***	2.248	101.090***	2.236	93.877***
CAREC	-0.166	-3.408***	-0.134	-2.650***	-0.145	-2.937***	-0.147	-2.989***
DCPS	0.004	7.8122***	0.005	10.653***	0.005	11.274***	0.005	8.046***
DBTLT	1.87E-12	10.235***						
DBTST	0.003	2.666***					0.003	2.397**
BNDPN			-2.17E-11	-1.709*	-2.30E-11	-1.794*	-2.79E-11	-2.052**
DBTLTPB			4.29E-12	6.792***	4.39E-12	6.964***	3.97E-12	6.091***
DBTLTPV			6.09E-13	1.223	7.10E-13	1.447	1.00E-12	1.993**
FDI$			-9.04E-13	-0.946212				
Adjusted R^2	0.4189		0.4490		0.4504		0.4313	
F-statistic	85.7083		64.1651		80.4815		60.4159	
AIC	0.4321		0.41065		0.4239		0.4147	
Schwarz Crit.	0.4762		0.4729		0.4756		0.4764	
H-Q Criterion	0.4494		0.4352		0.4442		0.4390	
D-W Statistic	0.8881		0.9056		0.8806		0.8811	

'β' indicates Coefficient; 'T' indicates T-Statistics
*p < 0.1; **p < 0.05; ***p < 0.01

Dependent Variable: Per Capita Income- US$ (PCI$)

Panel Least Squares
Periods included: 5; Cross-sections included: 163;
Total (Unbalanced) observations: 745
Sample: 2007-2016

Explanatory Variable	Model: I		Model: II		Model: III		Model: IV	
	B	T	B	T	β	T	β	T
Constant	-59250.370	-26.032***	-53604.930	-18.474***	-3939.615	-3.548***	-3902.896	-3.503***
LGSTALL	24006.820	28.721***	20937.440	17.147***	2143.801	4.744***	2119.086	4.654***
EXPR	98.649	5.932***	101.429	6.027***	36.950	4.725***	36.319	4.572***
FDIINF	71.781	2.305**	58.339	1.850*	-19.374	-1.243	-19.255	-1.234
DCPS			52.365	3.568***	12.451	2.239**	11.885	2.086**
DBTTOT					4.42E-09	4.544***	4.30E-09	4.279***
DBTST							5.468	0.466
Adjusted R^2	0.6195		0.6215		0.2818		0.2806	
F-statistic	404.7174		293.2161		36.5539		30.4445	
AIC	21.6765		21.6874		18.5596		18.5635	
Schwarz Crit.	21.7012		21.7195		18.6140		18.6270	
H-Q Criterion	21.6860		21.6998		18.5810		18.5885	
D-W Statistic	1.0333		1.0374		1.0848		1.0852	

'β' indicates Coefficient; 'T' indicates T-Statistics
*p < 0.1; **p < 0.05; ***p < 0.01

Dependent Variable: Per Capita Income- US$ (PCI$)

Panel Least Squares
Periods included: 5; Cross-sections included: 163;
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Sample: 2007-2016

Explanatory Variable	Model: I		Model: II		Model: III		Model: IV	
	B	T	B	T	β	T	β	T
Constant	-52602.890	-24.574***	-45841.790	-17.668***	-3068.259	-3.203***	-3045.596	-3.174***
LGSTQLTY	21770.890	27.559***	17962.350	16.274***	1796.445	4.616***	1775.058	4.538***
EXPR	123.801	7.407***	121.481	7.210***	38.913	4.949***	38.103	4.769***
FDIINF	65.238	2.051**	48.345	1.513	-19.568	-1.253	-19.403	-1.242
DCPS			71.070	4.944***	14.387	2.657***	13.622	2.444**
DBTTOT					4.51E-09	4.650***	4.36E-09	4.337***
DBTST							6.865	0.586
Adjusted R^2	0.6029		0.6101		0.2800		0.2789	
F-statistic	377.4923		279.5182		36.2320		30.2063	
AIC	21.7191		21.7170		18.5621		18.5658	
Schwarz Crit.	21.7439		21.7490		18.6165		18.6293	
H-Q Criterion	21.7287		21.7294		18.5836		18.5908	
D-W Statistic	1.0211		1.0337		1.0761		1.0766	

'β' indicates Coefficient; 'T' indicates T-Statistics
*p < 0.1; **p < 0.05; ***p < 0.01

Important Role of the Short-term Financing

- Most important conclusion is the identification of short-term external borrowing as most effective mode of financing. Share of short-term debt in total external debt affects the logistic infrastructure positively. The effects of short-term debts are robust and significant.
- Results show significant and robust effects of short-term external borrowing also on growth and development.
- The strong, significant and robust impact of the share of short-term borrowing in total external debt on income and Infrastructure development indicates the pressure on policy makers and economic managers for effective and efficient utilization of resources. In fact, in the presence of short-term loans the managers have to show their success in short-term. They cannot transfer the burden of repayments and their policies on the forthcoming governments.

Long-term External Debt and Domestic Credit

- Effects of domestic credit to private sector in determination of logistic infrastructure are also positive.
- Other than domestic credit to private sector, the most important significant determinant of ‘logistic infrastructure development’ is the ‘long-term public sector external debt which indicates that utilization of public sector external long-term debt plays an important role in the improvement of infrastructure.
- Surprisingly, no significant impact of the private sector external debt on logistic infrastructure development has been proved. The private sector bonds for long-term financing, private sector long-term debts and Foreign Direct Investment (FDI) have not been recognized as significant determinants of the magnitude or quality of the logistic infrastructure, which indicate that long-term external financing to private sector does not have a significant role in determination of logistic infrastructure.

Determinants of Income

- Quality and magnitude of the logistic infrastructure have been proved important determinants of the per capita income, which establishes a causal relation between infrastructure and economic growth.
- Positive and significant effects of the exports on per capita income have also been confirmed
- The higher share of short-term borrowing in external debts and long-term public sector debts have been identified as good options for the growth and development. While, the role of expansion in the domestic credit to private sector is also important.

Policy Recommendations

For IFIs:

- The global financial architecture should focus on the provision of short-term lending facility to improve the efficiency of developing projects.

For CAREC Countries:

- Focus on improving the sustainable logistic infrastructure is required to improve Per Capita Income (PCI).
- A trade-led growth model can ensure simultaneous development of logistic infrastructure, exports and PCI.
- To unlock private investment, monetary policy can ensure enhancement in credit to private sector, which is a significant determinant of PCI and Sustainable infrastructure development.
- External long-term borrowing by public sector can play a significant role in development of sustainable infrastructure, however the higher share of short-term borrowing in total external borrowing indicates efficient utilization of funds for infrastructure.
- Creation of viability funds to support the private sector projects, provision of guarantees for collection of user charges, subsidized credit and tax incentives can play an important role in unlocking private sector investment in sustainable infrastructure projects