

Entrepreneurship, knowledge and macro-economic growth

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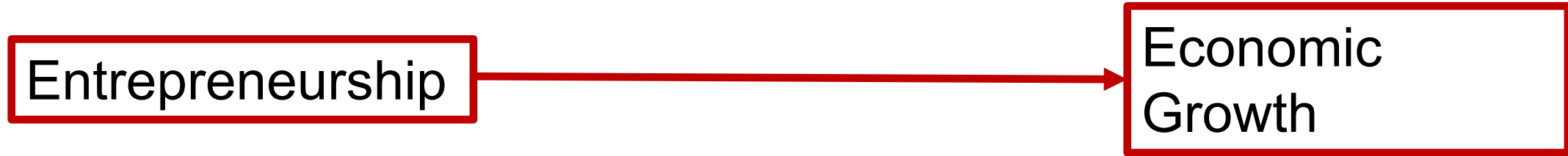
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The entrepreneurship-economic growth relation

- Revisiting entrepreneurship-economic growth relation
- Dealing with the role of institutional knowledge
- Two reasons why
 - A beautiful example of the value of GEM
 - Historic reasons
- Van Stel, Carree and Thurik, *Small Business Economics*, 2005
- Using Martin Carree and Roy Thurik, “Entrepreneurship, the knowledge sector, and national economic growth: testing the knowledge spillover theory of entrepreneurship” for *Review of Industrial Organization*

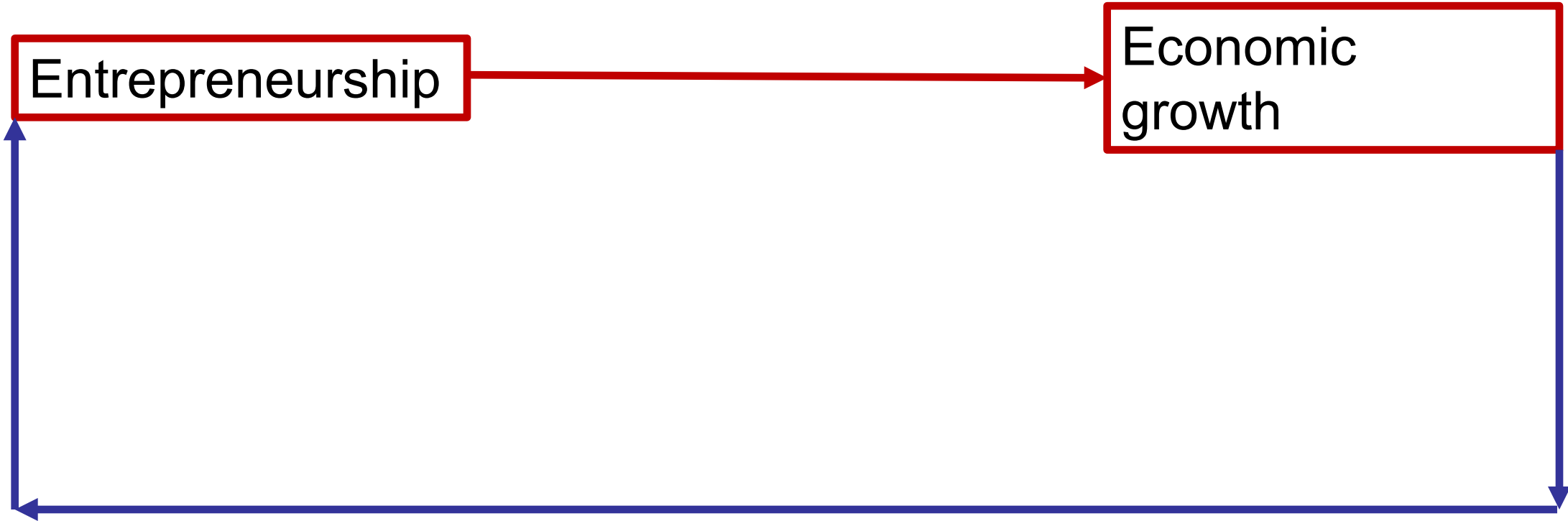
The entrepreneurship-economic growth relation



Contribution of entrepreneurship/small businesses

- Change and newness: within
- Variation and experiment: among
- Turbulence: replace and displace
- Killer of monopoly power
- Self-realisation: better educated
- Breaking the knowledge filter
- Motivation: avoiding red tape
- Employment: 1st and 2nd order (Gibrat's law)
- Lower compensation
- Absorption of uncertainty

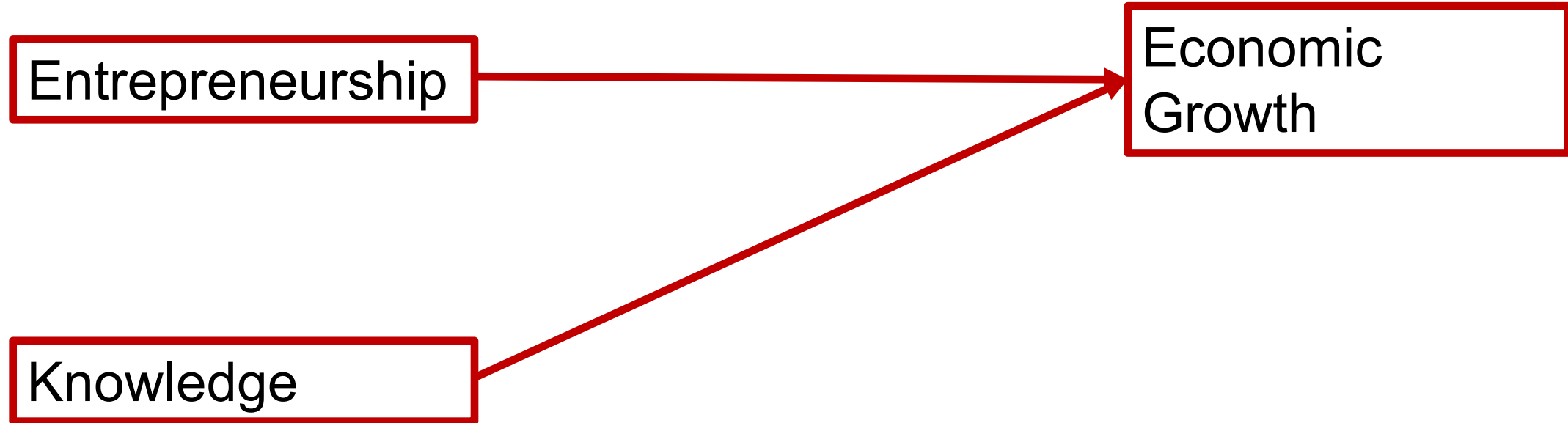
The entrepreneurship-economic growth relation



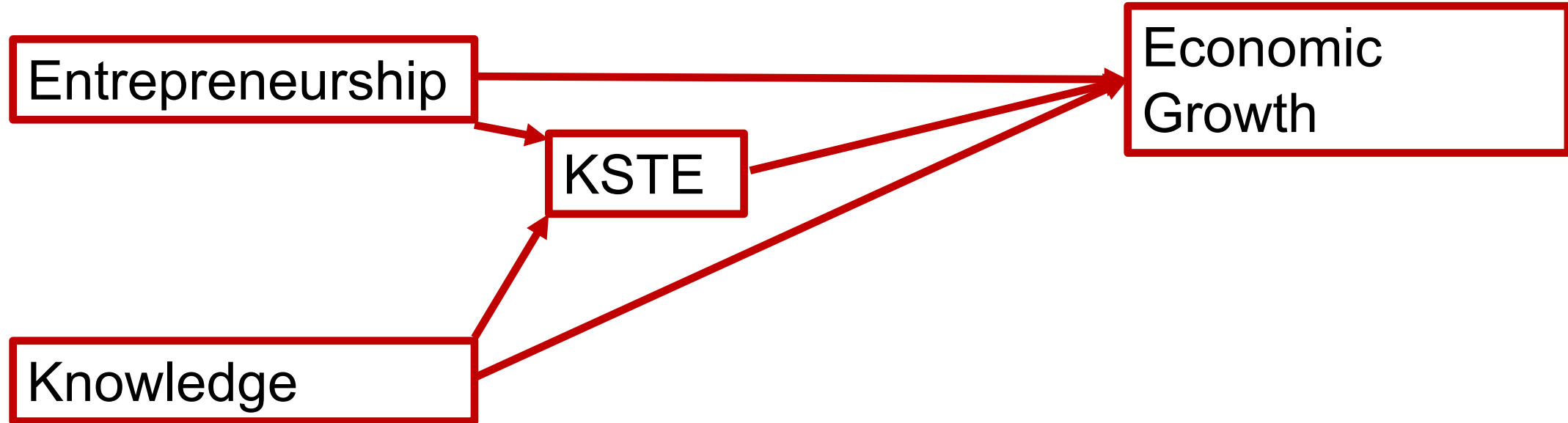
Knowledge spillover theory of entrepreneurship

- New knowledge does not lead to growth
- Filters between new knowledge and its commercial exploitation
- Conduits provide solutions: entrepreneurship
- From inventions to innovations
- "KTSE provides a theoretical framework for understanding how knowledge translates into entrepreneurial activity and economic growth" Audretsch et al. (2025).
- Entrepreneurs act as agents of change, and businesses do not

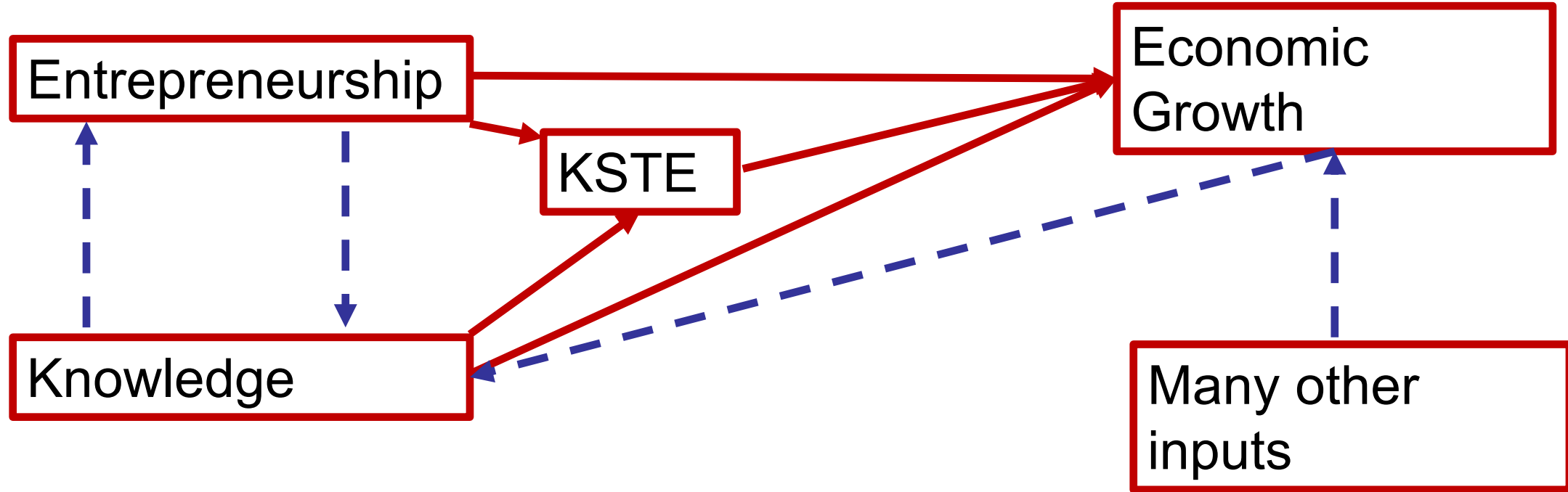
The entrepreneurship-knowledge-growth relation



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The data

- Economic growth: World Economic Outlook Database from the International Monetary Fund (IMF)
- Entrepreneurship: Total early-stage Entrepreneurial Activity (TEA) measure from the Global Entrepreneurship Monitor (GEM)
- Knowledge
 - number of top 100 **universities** worldwide (Shanghai Index)
 - number of per capita **publications** (Scopus)
 - number of **scientists** per million inhabitants (Vasiliadis et al., 2024).
- Controls
 - control for corruption index, oil country dummy, (civil) war dummy, tax haven dummy, year dummy

The data

- GEM: 115 countries in the period 2001-2024 = 2760
- 1581 missings
- 16 exclusions
- Highly unbalanced panel
 - 103 countries
 - 24 years
 - 1163 out of $2472=24*103$
- Van Stel et al. (2005): 36 countries and 1 year

A linear model at macro-level

$$g_{i,t+1} = \sum_{t=1}^{24} a_t + \beta_1 g_{it} + \beta_2 g_{i,t-1} + \beta_3 GdpCap_{it} + \beta_4 TEA_{it} + \\ + \beta_5 TEA_{it} GdpCap_{it} + \beta_6 KNOW_{it} + \beta_7 TEA_{it} KNOW_{it} + \varepsilon_{i,t+1}$$

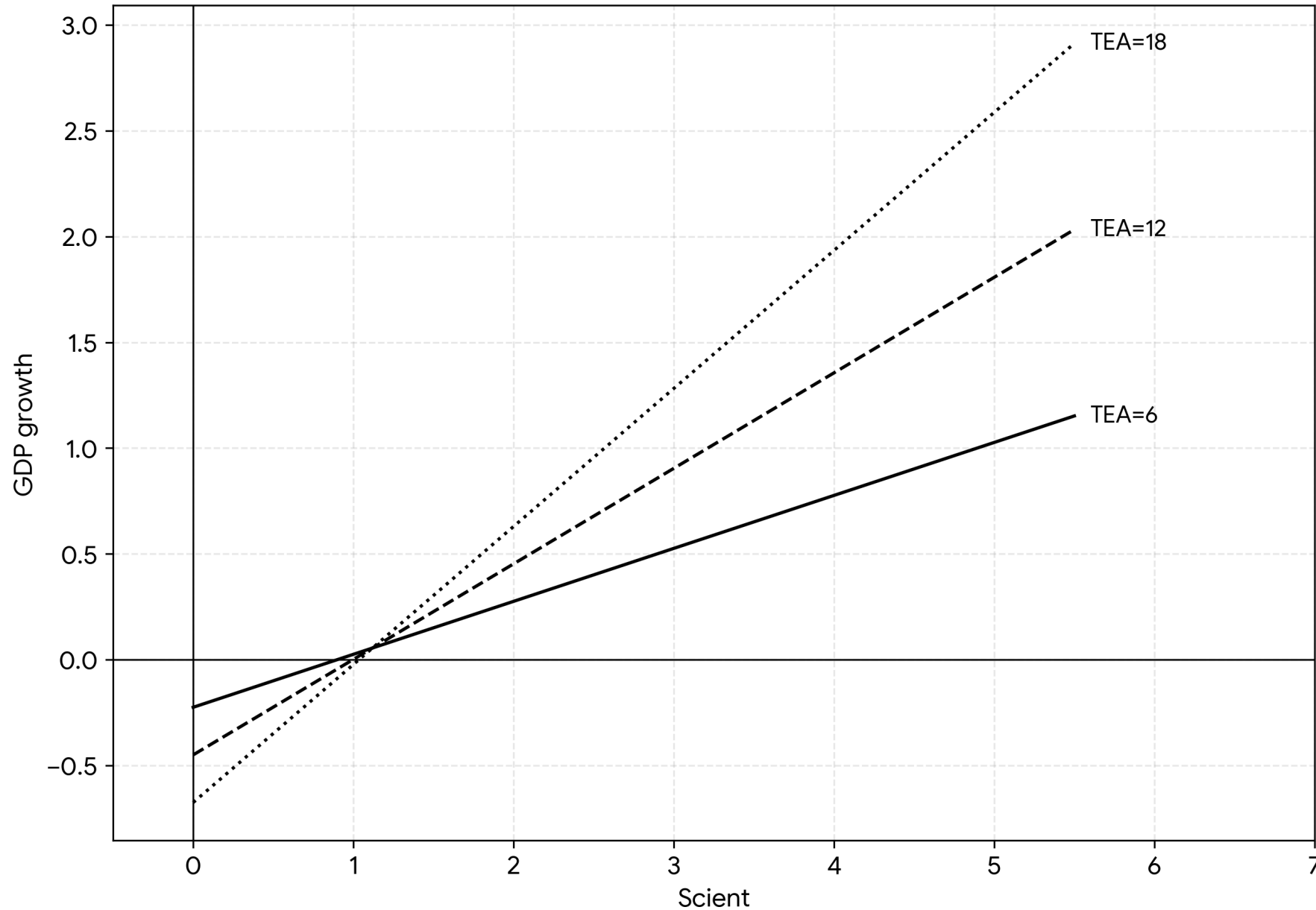
Economic growth (g) is a function of TEA_{it} and $KNOW_{it}$ and their interaction. In the model $KNOW_{it}$ is either $Top100_{it}$, $Public_{it}$ or $Scient_j$. The i -index is the country and the t -index is the year.

Summary statistics

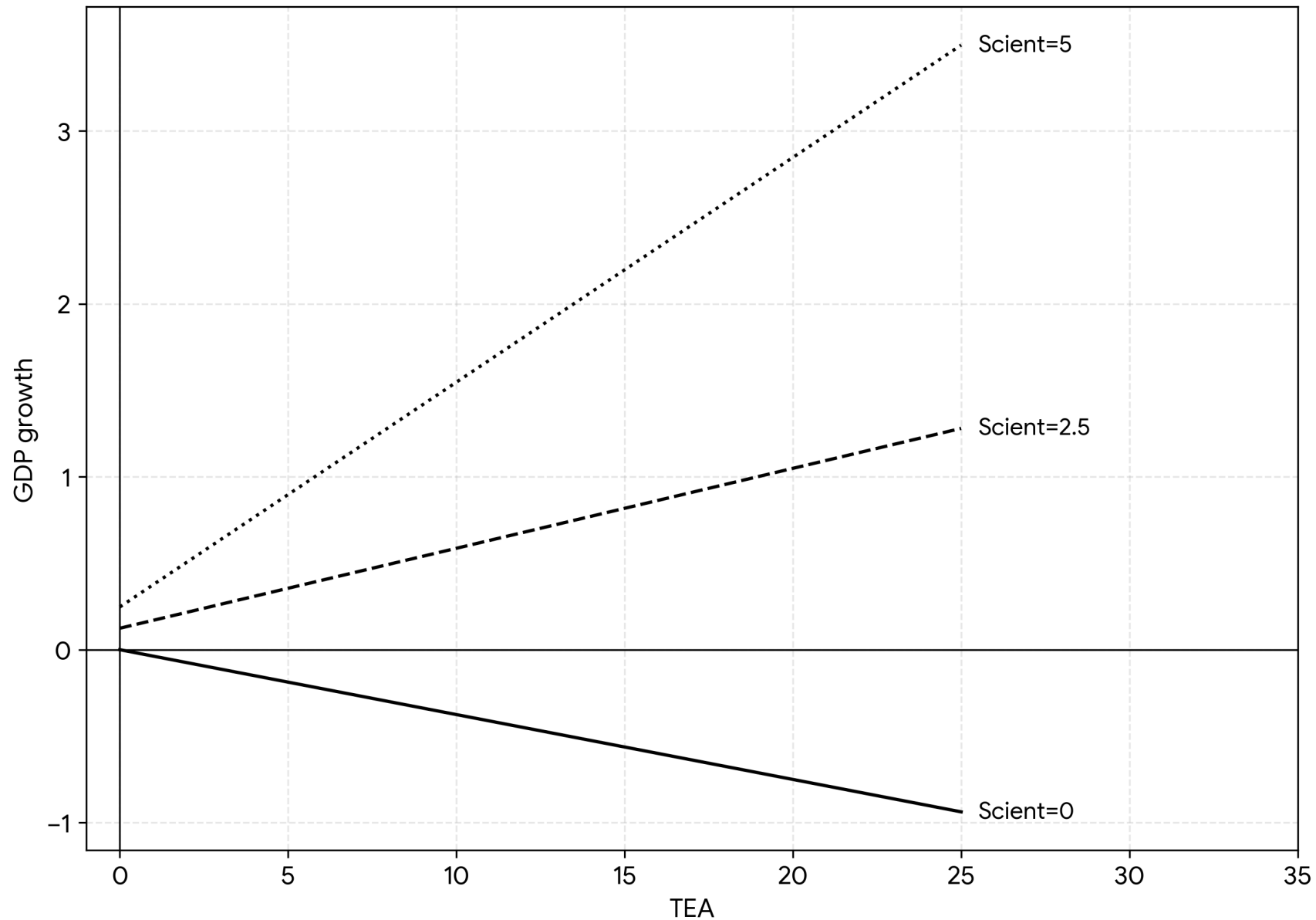
	Mean	Min	Max	$g_{i,t+1}$	g_{it}	$g_{i,t-1}$	$GdpCap_{it}$	TEA_{it}	$Top100_{it}$	$Public_{it}$	$Scient_i$
$g_{i,t+1}$	2.598	-17.67	24.62	1	0.315	0.161	-0.167	0.156	-0.115	-0.218	-0.139
g_{it}	2.792	-16.04	24.62	0.315	1	0.298	-0.157	0.170	-0.133	-0.251	-0.179
$g_{i,t-1}$	2.880	-17.67	24.62	0.161	0.298	1	-0.158	0.166	-0.130	-0.255	-0.173
$GdpCap_{it}$	37.864	1.437	140.41	-0.167	-0.157	-0.158	1	-0.412	0.402	0.749	0.726
TEA_{it}	11.768	1.480	49.60	0.156	0.170	0.166	-0.412	1	-0.216	-0.575	-0.492
$Top100_{it}$	0.418	0	4.078	-0.115	-0.133	-0.130	0.402	-0.216	1	0.414	0.609
$Public_{it}$	0.031	-5.832	2.360	-0.218	-0.251	-0.255	0.749	-0.575	0.414	1	0.755
$Scient_i$	2.215	0	5.652	-0.139	-0.179	-0.173	0.726	-0.492	0.609	0.755	1

Regression results (weighted)

Regression results (weighted)



Regression results (weighted)



Conclusions

- The knowledge sector without entrepreneurial activity does not contribute to economic growth
- Entrepreneurial activity without a strong knowledge sector does not contribute to economic growth
- The interplay between entrepreneurship and knowledge, however, shows a positive and generally significant effect on economic growth
- Many policy implications

Conclusions

- Reinterpreting Van Stel et al. (2005): developing countries without knowledge infrastructure
- No new theory: ok but maybe less influential
- No internal replication: pity but robustness tests
- Many follow-ups

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