

XIV Anoldshain Seminar

INDUSTRY DIVERSIFICATION AND FINANCIAL DEVELOPMENT

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UNC and UNdeC; UNC, CONICET and CIPPES

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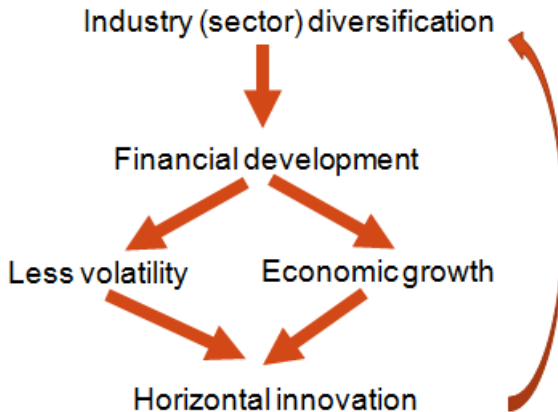
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INTRODUCTION



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- Schlarek, 2007 (theory): more industries, lower aggregate liquidity risk, higher financial development. The problem: low horizontal innovation.

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- Utility of banks (mean-variance preferences): $E(Rp) - \gamma/2V(Rp)$, where Rp is return on portfolio investment and γ is positive risk aversion parameter.

- Banks maximization problem in period 0 with ONE sector.

$$\max_I E(R)I + S - \frac{\gamma}{2}I^2 V(R) \quad (1)$$

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- A: banks initial funds

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- When J sectors and each sector receives $1/J$ of total credit, expected utility becomes.

$$\begin{aligned} E(U) &= E(R_P) - \frac{\gamma}{2} V(R_P) \\ &= \sum_{j=1}^J E(R) \alpha_j I + S - \frac{\gamma}{2} \sum_{j=1}^J V(R \alpha_j I) \\ &= \sum_{j=1}^J E(R) \frac{1}{J} I + S - \frac{\gamma}{2} \sum_{j=1}^J V(R \frac{1}{J} I) \\ &= E(R) I + S - \frac{\gamma}{2J} I^2 V(R), \end{aligned}$$

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- Banks maximization problem in period 0 (J sectors).

$$\begin{aligned} \max_I \quad & E(R) I + S - \frac{\gamma}{2J} I^2 V(R) \\ \text{s.t.} \quad & I + S \leq A. \end{aligned} \tag{2}$$

- Optimal behavior of banks (portfolio decision) in period 0.

$$\{I^*, S^*\} = \left\{ \frac{(E(R) - 1)J}{\gamma V(R)}, A - \frac{(E(R) - 1)J}{\gamma V(R)} \right\}. \quad (3)$$

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- Policy implications: horizontal innovation leads to financial development.

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- Industrial diversification: Hirschman-Herfindahl concentration Index (0: low concentration/high diversification; 1: high concentration/low diversification).

$$HHI = \sum_{i=1}^N (s_i)^2$$

- Fin1: Bank liquid liabilities to GDP.

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- Fin1: Bank liquid liabilities to GDP.
- Fin2: Bank Credit/ Bank deposits.
- Private Credit By Deposit Money Bank/GDP.
- Fin4: Private Credit By Deposit Money Bank and Other Financial Institutions/GDP.

- DivSec1: Hirschman-Herfindahl Index.

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- DivSec2: Export Diversification Index (IMF).

Table 1: Data Sources for the different variables used

Variable	Definition	Source
Financial Development	Bank liquid liabilities to GDP (<i>FIN1</i>) Bank credit over bank deposits (<i>FIN2</i>) Private credit lent by banks to GDP (<i>FIN3</i>) Private credit granted by banks and other financial institutions to GDP (<i>FIN4</i>)	Financial Structure Dataset
GDPcp	Gross domestic product per capita	WDI
Inflation	Percentage change to consumer prices index	WDI
Trade openness	Trade to GDP	WDI
Financial openness	Kaopen Index	Chinn and Ito (2006), and Lane and Milesi-Ferretti (2007)
Institutional quality	Icrg Index	Dahlberg, Stefan (2016) Marshall et al. (2011)
Legal origin	United Kingdom, German French and Socialist Legal Origin	Shleifer (2002)
Exports	Export value	World Integrated Trade Solution (WITS)

- Cross Section Model.

$$\begin{aligned} \ln Fin_i = & \alpha + \alpha_1 \ln Div_i + \alpha_2 \ln TO_i + \alpha_3 \ln Inf_i + \alpha_4 \ln GDP_{cp_i} \\ & (4) \\ & + \alpha_5 Volatility_i + \alpha_6 \ln Inst_i + \alpha_7 LO_i + \alpha_8 \ln Kaopen + \alpha_9 TOFO + \mu_i \end{aligned}$$

- Dynamic Panel Data Model.

$$\begin{aligned} \ln Fin_{i,t} = & \alpha + \alpha_1 \ln Fin_{i,t-1} + \alpha_2 \ln Div_{i,t-1} + \alpha_3 \ln TO_{i,t-1} + \alpha_4 TOFO_{i,t-1} \\ & + \alpha_5 Kopen_{i,t-1} + \alpha_6 Volatility_{i,t-1} + \alpha_7 \ln Inf_{i,t-1} \\ & + \alpha_8 \ln GDPcp_{i,t-1} + \mu_{it} \end{aligned}$$

Table 3: Cross Section Estimation - Dependent Variable: Private Credit Lent by Banks to GDP

	<i>HHI2</i>	<i>HHI3</i>	<i>HHI4</i>	<i>EXPIMF</i>
<i>Diversification</i>	-0.24**	-0.21***	-0.19***	-0.35
<i>TradeOpenness</i>	-0.14	-0.13	-0.13	-0.09
<i>Tofo</i>	-0.31**	-0.34**	-0.34**	-0.30**
<i>Kaopen</i>	1.16*	1.28**	1.29**	1.13*
<i>Ierg</i>	0.24	0.20	0.23	0.25
<i>Volatility</i>	-0.01	-0.00	-0.01	-0.04
<i>Inflation</i>	-0.28***	-0.27***	-0.27***	-0.27***
<i>GDPpc</i>	0.42***	0.41***	0.42***	0.48***
<i>Legor_{uk}</i>	0.46***	0.42**	0.46***	0.58**
<i>Legor_{fr}</i>	0.31**	0.28*	0.34**	0.48**
<i>Legor_{ge}</i>	0.52***	0.28***	0.49***	0.63**
R2	0.98	0.98	0.98	0.98

Note:***, **, * imply significance at 1, 5 and 10%, respectively.

Table 4: Dynamic Panel Data Estimation - Dependent Variable: Private Credit Lent by Banks to GDP

	<i>HHI2</i>	<i>HHI3</i>	<i>HHI4</i>
<i>FinancialDev</i> _{<i>t</i>-1}	0.89***	0.88***	0.87***
<i>Diversification</i> _{<i>t</i>-1}	-0.03**	-0.02*	-0.02*
<i>TradeOpenness</i> _{<i>t</i>-1}	0.18	0.17	0.17
<i>Tofo</i> _{<i>t</i>-1}	-0.01	-0.01	-0.01
<i>Kaopen</i> _{<i>t</i>-1}	-0.01	0.01	0.01
<i>Volatility</i> _{<i>t</i>-1}	-0.04***	-0.04***	-0.04***
<i>Icrg</i> _{<i>t</i>-1}	0.11***	0.11***	0.13***
<i>Inflation</i> _{<i>t</i>-1}	-0.01	-0.01	-0.01
<i>GDPpc</i> _{<i>t</i>-1}	0.04***	0.44***	0.05***
A-B Test AR(1)	-2.24 (0.025)	-2.25 (0.025)	-2.25 (0.024)
A-B Test AR(2)	-1.63 (0.104)	-1.64 (0.101)	-1.61 (0.107)
Sargan Test	81.24 (0.006)	79.29 (0.009)	42.94 (0.02)
Hansen Test	58.57 (0.247)	58.08 (0.261)	55.73 (0.34)
Note:***; **; * imply significance at 1, 5 and 10%, respectively.			

Table 5: Dynamic Panel Data Estimation - Dependent Variable: Private Credit Lent by Banks to GDP

	EXPIMF	INTENSIVE	EXTENSIVE
$FinancialDev_{t-1}$	0.85***	0.85***	0.88***
$Diversification_{t-1}$	-0.15***	-0.09**	0.02**
$TradeOpenness_{t-1}$	0.10	0.04	0.003
$Tofo_{t-1}$	0.05	0.01	-0.01
$Kaopen_{t-1}$	-0.21	-0.08	-0.01
$Volatility_{t-1}$	-0.03**	-0.03***	-0.03***
$Icrg_{t-1}$	0.11*	0.14**	0.14 **
$Inflation_{t-1}$	-0.02**	-0.02*	-0.02
$GDPpc_{t-1}$	0.05*	0.07**	0.06 *
A-B Test AR(1)	-2.98 (0.003)	-2.88 (0.004)	-1.77 (0.08)
A-B Test AR(2)	-1.58 (0.114)	-1.47 (0.141)	-0.86 (0.392)
Sargan Test	55.95 (0.003)	54.09 (0.012)	-48.81 (0.02)
Hansen Test	43.51 (0.114)	35.39 (0.356)	30.03 (0.464)
Note:***, **, * imply significance at 1, 5 and 10%, respectively.			

Table 6: Dynamic Panel Data Estimation - Dependent Variable: Private Credit Lent by Banks to GDP-Developing Countries

	HHI2	HHI3	HHI4	EXPFMI
<i>FinancialDev</i> _{<i>t</i>-1}	0.91***	0.91***	0.89***	0.85***
<i>Diversification</i> _{<i>t</i>-1}	-0.04	-0.03	0.02	-0.19**
<i>DevelopingDiversification</i>	-0.08**	-0.06**	-0.05*	0.04
<i>TradeOpenness</i> _{<i>t</i>-1}	0.00	0.01	0.01	0.09
<i>Tofo</i> _{<i>t</i>-1}	-0.01	-0.01	-0.01	0.04
<i>Kaopen</i> _{<i>t</i>-1}	-0.01	0.01	0.03	-0.17
<i>Volatility</i> _{<i>y</i><i>t</i>-1}	-0.04***	-0.04***	-0.04***	-0.03**
<i>Icrg</i> _{<i>t</i>-1}	0.24***	0.23***	0.23***	0.13**
<i>Inflation</i> _{<i>t</i>-1}	-0.01	-0.01	-0.01	-0.02**
<i>GDPpc</i> _{<i>t</i>-1}	0.05***	0.06***	0.06***	0.06*
A-B Test AR(1)	-2.21 (0.03)	-2.22 (0.03)	-2.24 (0.03)	-2.98 (0.003)
A-B Test AR(2)	-1.53 (0.13)	-1.55 (0.12)	-1.54 (0.12)	-1.55 (0.12)
Sargan Test	66.75 (0.07)	65.61 (0.08)	65.98 (0.08)	55.29 (0.01)
Hansen Test	53.43 (0.38)	55.26 (0.32)	54.03 (0.36)	42.18 (0.11)

Note:***, **, * imply significance at 1, 5 and 10%, respectively.

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CONCLUSION

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- Govt. subsidy: credit policy, fiscal policy, education and RD policy, coordination of innovation policy, etc.