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The relationship between the expansion of the banking sector and export specialisation in developing countries

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Motivation

- Context: Finance and growth research
- Channel: finance (banking sector development) and export specialisation
- Mainstream theory
 - Financial development disproportionately favours external finance dependent sectors/firms  innovative and technologically advanced → shift in comparative advantage → product diversification in the export basket
- Heterodox theory
 - Deeper financial sectors will not help (may even hinder) innovation and technological progress

Research question

- What evidence is there about the relationships between banking sector development and (1) sophistication of export baskets and (2) their product diversification?
 - Relatively unexplored area of research

Finance and technological progress

- Mainstream view: developed financial systems are ‘wise’
 - They mobilise savings, reduce transaction and monitoring costs, facilitate risk diversification and the acquisition of information about investment projects
 - investment ↑ and more productive
- Financial development favours activities more dependent on external finance
 - Manufacturing
 - Sector with more limited endowments of tangible assets
 - Activities with high up-front fixed costs (e.g., exports)
 - “Financial development allows new ideas to develop and challenge existing ones” (Rajan and Zingales, 1998)

(continued)

- Theoretical shortcoming: modelling/conceptualisation of technological advancement
 - Mainstream: technological development depends mostly on technological transfer (through foreign direct investment)
 - This overlooks two essential aspects of technological progress:
 - Centrality of learning
 - The tacit character of knowledge/technology
 - Technological progress takes place mainly through learning
 - Finding technological alternatives, selecting a technology, learning how to use it efficiently, i.e., adapting it to developing countries' conditions
 - Access to foreign technology does not immediately entail its effective use
 - Assimilation and absorption of foreign technology requires an understanding of the tacit elements of technology
 - Success is based on capabilities (learning) developed through training and experience and investment in technological change.

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- This process involves costs and risks
 - Even a developed financial system is unlikely to channel finance towards these investments
- Informational asymmetries
 - Lack of a track record of managers' entrepreneurial skills
 - Little incentive for the innovator to disclose inside information about the project (the innovator may be copied)
- Fundamental uncertainty
 - Uncertainty about profitability of innovative projects
 - Not just difficulty for outside funders to distinguish between high and low value opportunities
- Learning rents
 - As the acquisition of tacit knowledge requires learning-by-doing, production will involve initial periods of loss making which will need to be financed

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- Financial liberalisation intensifies market failures: bank finance driven by short termism
 - Projects with front loaded returns are favoured
 - Entrepreneurial learning is discouraged
 - High risk premia for projects related to technological advancement
 - Finance is available for firms which invest in (lower risk) known technologies
- Financial development does not ameliorate market failures that prevent funding of innovative projects and could make matters worse

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- Moreover, as the tacit element of technology is more important for more sophisticated goods, generalised intervention (e.g., trade and financial liberalisation, human capital investment) would most likely cause countries to exploit their existing comparative advantages
 - It is sectors which are already internationally competitive that have access to funding
 - Countries specialise in technologies and products with lower learning potential (low tech, low value added)
- Financial development leads to a reduction in the degree of sophistication

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- Financialisation → radical transformation of the relationship between financial institutions and both non-financial corporations and households
 - Financialisation is particularly strong in middle income countries but is also relevant in many low income countries where significant proportion of total banking assets are foreign owned (in Africa)
 - Banks lend to the government and household sectors (more profitable and less risky)
 - The expansion of lending to the household sector – often a response to the entry of foreign banks – has led to a contraction in business lending

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- Diversification of the export basket
 - No theoretical model of reference for the determinants of export diversification
 - Mainstream story: Financial development relaxes liquidity constraints → increase in number of exporters → diversification
 - On the other hand, if banks provide finance for activities where the country is already competitive → concentration

Empirical analysis

- Export sophistication
 - *EXPY* (Hausmann et al, 2007)
 - Constructed in two stages: (1) the productivity level of each good ('index of revealed technology content of a product'); (2) *EXPY* (the productivity level of a country's export basket)
 - The share of technology and skill-intensive manufactured exports
- Export concentration
 - Herfindahl index of product concentration
- Banking sector depth
 - Ratio of liquid liabilities of the financial system to GDP ('LIQ')
 - Ratio of total claims of deposit money banks on domestic non-financial sector to GDP ('SIZE')
 - Ratio of domestic credit by deposit money banks to private firms to GDP ('DEV')

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- Share of deposit money bank claims in the total claims of domestic money banks and central bank on domestic non-financial sector ('CBN')
- Composite indicator 1: The sum of standardised values of private credit to GDP and liquid liabilities to GDP ('FID')
- Composite indicator 2: The sum of standardised values of all four basic indicators ('FinDev')

Table 1: EXPY index, descriptive statistics

| | 1985 | 1990 | 1995 | 2000 |
|--------------------------------|----------|----------|----------|----------|
| Minimum | 2128.14 | 1782.90 | 2095.96 | 1960.96 |
| 1st quartile | 3483.92 | 4027.40 | 4240.78 | 5099.87 |
| Median | 5047.77 | 5277.91 | 5767.42 | 6269.16 |
| Mean | 5523.74 | 5677.13 | 6170.62 | 7040.14 |
| 3rd quartile | 6569.83 | 7087.11 | 7794.71 | 8966.26 |
| Maximum | 12082.10 | 11445.10 | 12921.40 | 14183.30 |
| Standard deviation | 2432.69 | 2228.63 | 2737.76 | 3052.08 |

Table 2: Share of high-tech exports, descriptive statistics

| | 1995 | 2000 | 2005 | 2010 |
|------------------------------|--------|--------|--------|--------|
| Minimum | 0.102 | 0.014 | 0.046 | 0.154 |
| 1 st quartile | 0.667 | 0.832 | 1.123 | 2.406 |
| Median | 1.727 | 2.552 | 3.549 | 5.447 |
| Mean | 4.001 | 3.859 | 5.429 | 7.388 |
| 3 rd quartile | 6.032 | 6.118 | 8.128 | 11.300 |
| Maximum | 19.512 | 17.057 | 26.721 | 38.271 |
| Standard deviation | 4.717 | 3.858 | 5.618 | 6.845 |
| Notes: Values in percentages | | | | |

Table 3: Index of export concentration, descriptive statistics

| | 1995 | 2000 | 2005 | 2010 |
|------------------------------|-------|-------|-------|-------|
| Minimum | 7.00 | 7.72 | 8.63 | 8.57 |
| 1 st quartile | 21.58 | 21.27 | 18.67 | 16.99 |
| Median | 30.84 | 29.83 | 28.41 | 26.90 |
| Mean | 35.62 | 35.81 | 35.03 | 33.26 |
| 3 rd quartile | 49.61 | 49.85 | 45.98 | 44.43 |
| Maximum | 85.00 | 92.76 | 91.71 | 85.41 |
| Standard deviation | 20.17 | 20.13 | 21.00 | 19.26 |
| Notes: Values in percentages | | | | |

Table 4: Indicators of banking sector development, descriptive statistics

| | Share of DMB claims | | | | Liquid liabilities | | | | Total claims on real sector | | | |
|--------------------------------|-----------------------|--------|--------|--------|--------------------------|--------|--------|--------|-----------------------------|--------|--------|--------|
| | 1985 | 1990 | 2000 | 2010 | 1985 | 1990 | 2000 | 2010 | 1985 | 1990 | 2000 | 2010 |
| Minimum | 15.57 | 22.55 | 14.46 | 49.52 | 4.46 | 5.52 | 8.34 | 13.00 | 2.91 | 3.26 | 5.23 | 6.45 |
| 1st Quartile | 56.57 | 60.98 | 70.45 | 82.32 | 20.05 | 19.38 | 21.86 | 29.35 | 19.23 | 16.10 | 19.24 | 23.36 |
| Median | 71.28 | 72.20 | 82.88 | 89.38 | 27.96 | 29.19 | 37.57 | 41.39 | 28.02 | 23.58 | 32.38 | 34.26 |
| Mean | 69.88 | 71.22 | 77.89 | 87.28 | 34.99 | 34.96 | 42.57 | 52.24 | 32.21 | 30.52 | 40.55 | 45.60 |
| 3rd Quartile | 88.35 | 89.53 | 92.01 | 95.54 | 43.02 | 40.22 | 52.34 | 70.49 | 36.59 | 39.15 | 57.39 | 62.03 |
| Maximum | 99.35 | 100.00 | 99.94 | 100.00 | 110.28 | 122.14 | 116.72 | 129.13 | 119.64 | 102.95 | 131.60 | 121.44 |
| Standard deviation | 20.57 | 19.41 | 19.03 | 11.77 | 23.27 | 24.61 | 27.63 | 30.54 | 22.32 | 21.27 | 30.51 | 30.60 |
| | | | | | | | | | | | | |
| | Private sector credit | | | | Intermediary development | | | | Financial development | | | |
| | 1985 | 1990 | 2000 | 2010 | 1985 | 1990 | 2000 | 2010 | 1985 | 1990 | 2000 | 2010 |
| Minimum | 1.70 | 2.39 | 3.33 | 4.59 | -2.34 | -2.20 | -2.20 | -2.02 | -7.02 | -5.67 | -5.47 | -4.42 |
| 1st Quartile | 13.72 | 12.8 | 14.45 | 17.17 | -1.39 | -1.45 | -1.24 | -0.70 | -2.34 | -2.49 | -1.99 | -0.90 |
| Median | 20.86 | 19.92 | 23.76 | 23.85 | -0.66 | -0.74 | -0.40 | -0.14 | -1.24 | -1.30 | -0.07 | 0.60 |
| Mean | 25.29 | 24.48 | 32.19 | 34.85 | -0.42 | -0.45 | 0.20 | 0.65 | -1.14 | -1.03 | 0.42 | 1.51 |
| 3rd Quartile | 29.55 | 29.73 | 35.05 | 45.20 | 0.14 | -0.12 | 0.61 | 1.48 | -0.46 | -0.16 | 1.50 | 2.93 |
| Maximum | 92.24 | 78.03 | 122.80 | 105.06 | 4.91 | 4.43 | 6.79 | 6.55 | 9.15 | 7.49 | 11.22 | 10.90 |
| Standard deviation | 18.58 | 18.07 | 28.36 | 26.28 | 1.39 | 1.46 | 2.13 | 2.08 | 2.80 | 2.76 | 3.77 | 3.51 |

Figure 1: Banking sector depth in countries increasing export sophistication (EXPY) more or less quickly, 1985-2000

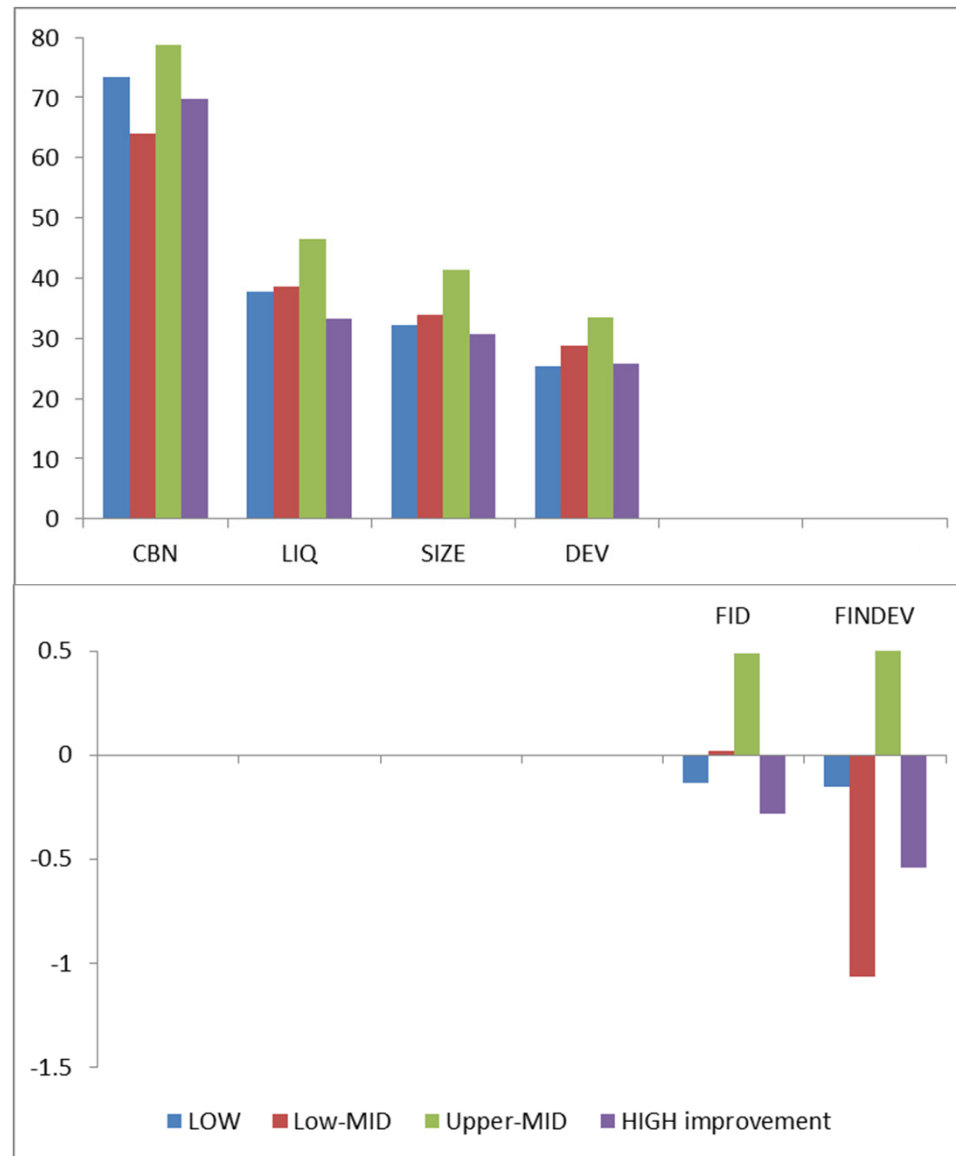


Figure 2: Banking sector depth in countries increasing export sophistication (High-Tech exports share) more or less quickly, 1995-2010

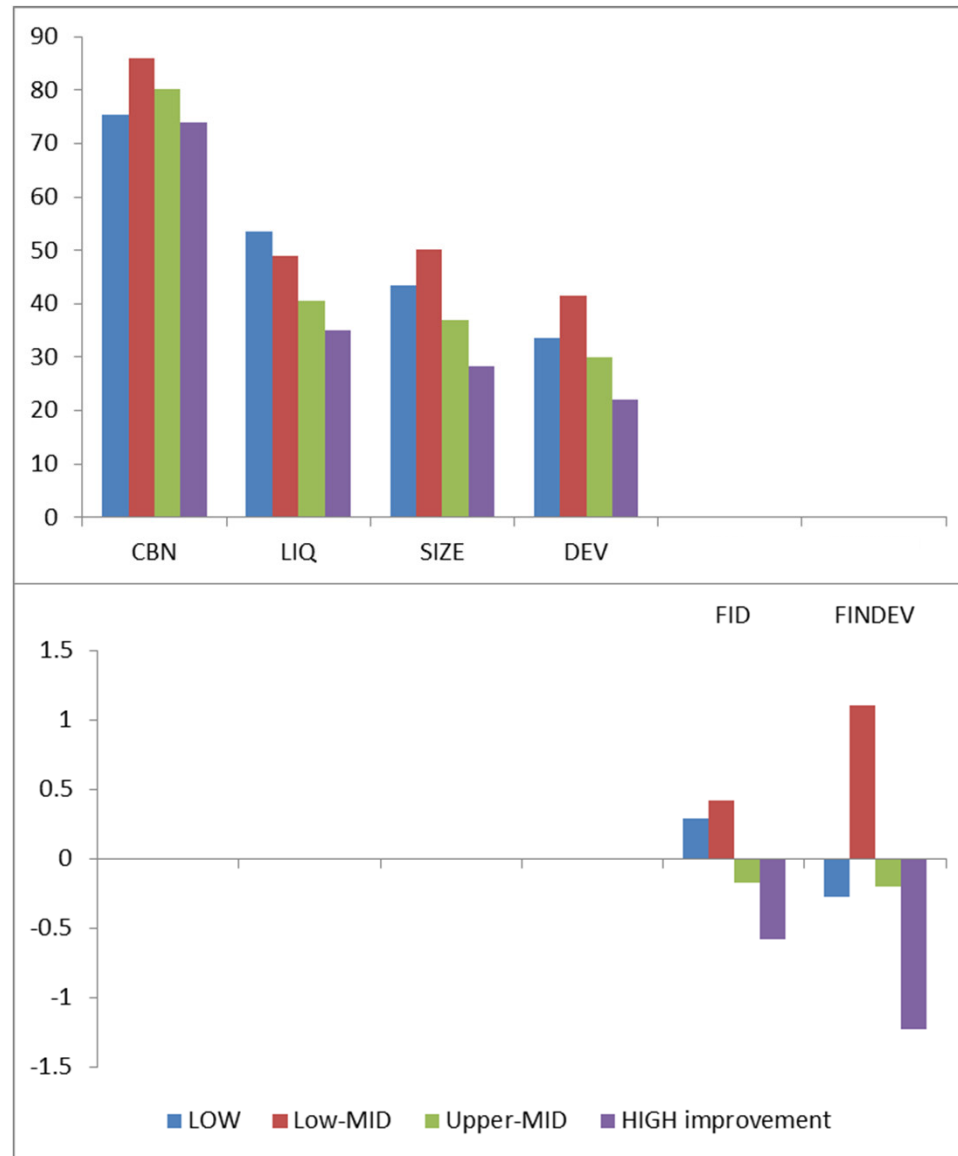


Figure 3: Banking sector depth in countries increasing export concentration more or less quickly, 1995-2010

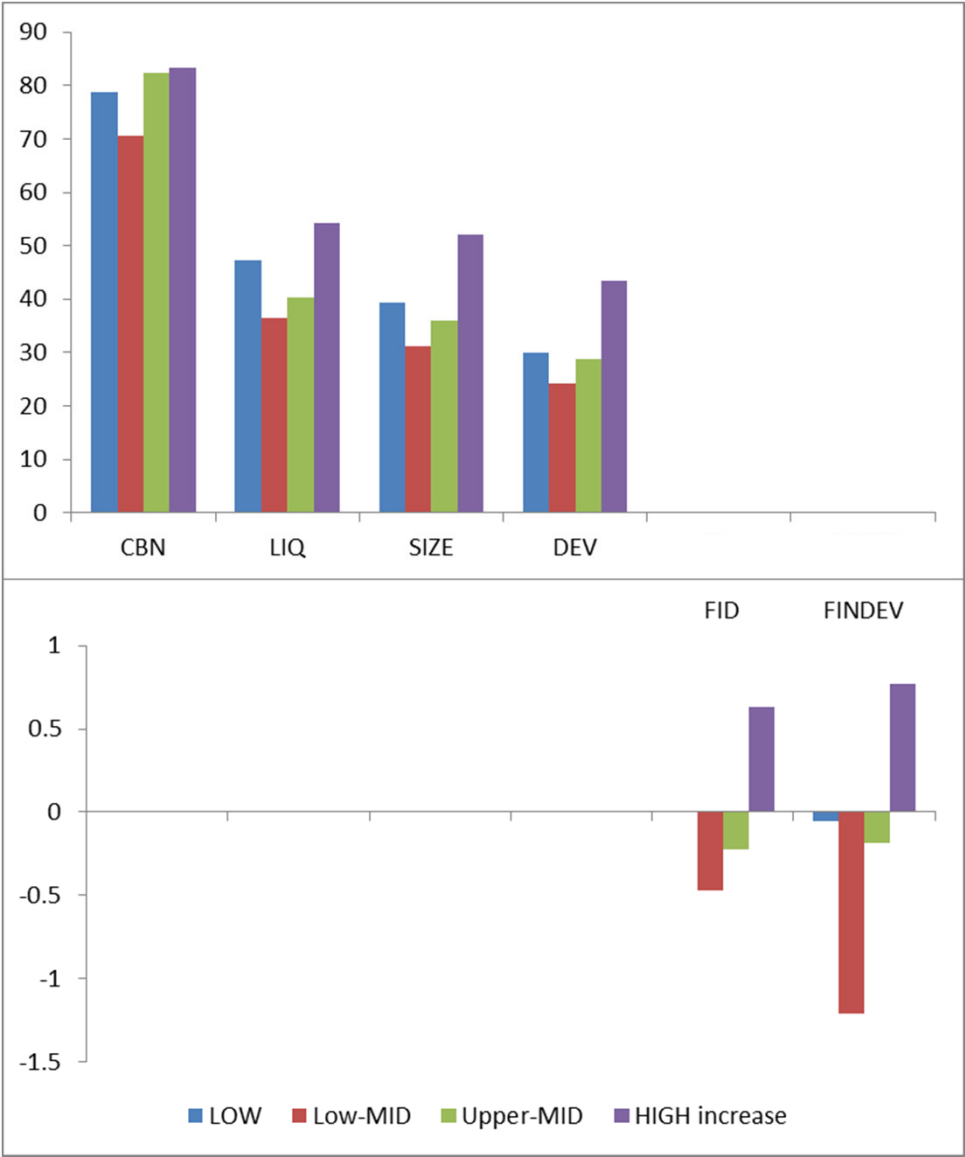


Table 5: Correlations between rates of growth in export sophistication and concentration and indicators of banking sector development

| | Banking sector development, period average | | | | | |
|---|---|--------------------|---------------------------|-----------------------|------------------|-------------------|
| | Share of DMB claims | Liquid liabilities | Total claims on NF sector | Private sector credit | FID | Fin Dev |
| Sophistication Growth (EXPY) | -.301* [.094] | -.295 [.102] | -.372** [.036] | -.406** [.021] | -.347* [.052] | -.367** [.039] |
| Sophistication growth (high-tech exports share) | -.303** [.013] | -.237* [.054] | -.281** [.021] | -.221* [.072] | -.229* [.062] | -.243** [.050] |
| Concentration growth | .280** [.022] | .163 [.183] | .212* [.083] | .233* [.055] | .203* [.097] | .152 [.220] |
| | Banking sector development, initial four-year average | | | | | |
| Sophistication Growth (EXPY) | -.118 [.528] | -.236 [.209] | -.375** [.041] | -.388** [.034] | -.317* [.088] | -.260 [.173] |
| Sophistication growth (high-tech exports share) | -.297** [.017] | -.207* [.094] | -.210* [.089] | -.203* [.099] | -.206* [.095] | -.208* [.099] |
| Concentration growth | .284** [.022] | .168 [.171] | .225* [.065] | .258** [.033] | .225* [.065] | .178 [.157] |

Table 5 (continued)

| | Banking sector development, final four-year average | | | | | |
|--|---|-------------------|--------------------|-------------------|-------------------|-------------------|
| Sophistication Growth (EXPY) | -.480*** [.006] | -.413** [.019] | -.435** [.013] | -.443** [.011] | -.440** [.012] | -.415** [.020] |
| Sophistication growth (high-tech exports share) | -.221* [.077] | -.236* [.057] | -.334*** [.006] | -.252** [.041] | -.254** [.039] | -.249** [.047] |
| Concentration growth | .237* [.055] | .190 [.124] | .190 [.124] | .216* [.080] | .208* [.091] | .126 [.317] |

Table 6: Regression results: Export sophistication (log of EXPY), 1985-2000

| | Banking sector development | | | | | |
|----------------------------------|----------------------------|-----------------------|---------------------------|-----------------------|-----------------------|------------------------|
| | Share of DMB claims | Liquid liabilities | Total claims on NF sector | Private sector credit | FID | Fin Dev |
| | -.458** (.214) | -.054 (.037) | -.073* (.044) | -.110* (.062) | -.011* (.006) | -.112*** (.043) |
| Lagged sophistication | .768*** (.114) | .763*** (.075) | .737*** (.091) | .732*** (.091) | .741*** (.084) | .777*** (.096) |
| Trade | .225* (.127) | .177** (.076) | .198** (.079) | .214** (.084) | .200*** (.078) | .280** (.139) |
| Income per capita | 9.39E-4** (4.80E-4) | 3.96E-4* (2.28E-4) | 4.83E-4** (2.31E-4) | 4.15E-4* (2.45E-4) | 4.35E-4* (2.43E-4) | 8.91E-4** (4.09E-4) |
| Human capital | .214 (.153) | .204* (.121) | .202** (.097) | .220** (.112) | .199* (.106) | .221 (.155) |
| Endowments | -.092** (.042) | -.058*** (.019) | -.066*** (.023) | -.074*** (.025) | -.064*** (.023) | -.118** (.047) |
| Foreign direct investment | .025** (.012) | .018*** (.007) | .019*** (.007) | .020*** (.007) | .019*** (.007) | .027** (.013) |
| | | | | | | |
| Wald test | 1332.11 [.000] | 3837.33 [.000] | 4973.91 [.000] | 3881.01 [.000] | 4641.64 [.000] | 947.47 [.000] |
| Hansen J-test | 3.85 [.427] | 3.35 [.501] | 2.63 [.621] | 2.81 [.590] | 3.15 [.534] | 3.54 [.472] |
| AR (1) errors | -3.16 [.002] | -3.27 [.001] | -3.29 [.001] | -3.24 [.001] | -3.26 [.001] | -3.16 [.002] |
| AR (2) errors | -.17 [.865] | -.26 [.791] | -0.24 [.812] | -.26 [.797] | -.26 [.793] | .12 [.902] |
| No. of observations | 847 | 862 | 866 | 865 | 862 | 828 |

Table 7: Regression results: Export sophistication (high-tech exports share), 1995-2010

| | Banking sector development | | | | | |
|----------------------------------|----------------------------|-----------------------|---------------------------|-----------------------|-----------------------|-------------------------|
| | Share of DMB claims | Liquid liabilities | Total claims on NF sector | Private sector credit | FID | Fin Dev |
| | -.046* (.026) | -.011** (.005) | -.013 (.008) | -.014 (.009) | -.002** (.001) | -.007* (.004) |
| Lagged sophistication | .781*** (.065) | .790*** (.078) | .801*** (.084) | .791*** (.089) | .770*** (.079) | .759*** (.062) |
| Trade | .022 (.016) | .016* (.009) | .016 (.010) | .017 (.010) | .019** (.009) | .024* (.015) |
| Income per capita | 7.81E-5** (3.28E-5) | 4.76E-5* (2.70E-5) | 3.47E-5 (2.57E-5) | 3.74E-5 (2.52E-5) | 4.43E-5* (2.52E-5) | 1.33E-4*** (4.08E-5) |
| Human capital | .027 (.022) | .028* (.016) | .026 (.019) | .026 (.019) | .032* (.018) | .033* (.018) |
| Endowments | -.008** (.004) | -.003 (.002) | -.003 (.002) | -.003 (.002) | -.003 (.002) | -.003** (.001) |
| Foreign direct investment | .002 (.001) | .001 (.001) | .001 (.001) | .001 (.001) | .001 (.001) | .003* (.002) |
| | | | | | | |
| Wald test | 1651.80 [.000] | 1726.48 [.000] | 2148.48 [.000] | 1753.70 [.000] | 1798.20 [.000] | 2141.57 [.000] |
| Hansen J-test | 3.51 [.476] | 13.70 [.187] | 13.46 [.199] | 12.90 [.230] | 12.78 [.236] | 1.61 [.806] |
| AR (1) errors | -2.90 [.004] | -2.92 [.003] | -2.93 [.003] | -2.90 [.004] | -2.87 [.004] | -2.90 [.004] |
| AR (2) errors | -.18 [.858] | -.16 [.875] | -0.12 [.902] | -.10 [.917] | -.10 [.920] | -.24 [.808] |
| No. of observations | 835 | 851 | 855 | 854 | 851 | 816 |

Table 8: Regression results: Export concentration, 1995-2010

| | Banking sector development | | | | | |
|---------------------------|----------------------------|--------------------|---------------------------|-----------------------|-------------------|--------------------|
| | Share of DMB claims | Liquid liabilities | Total claims on NF sector | Private sector credit | FID | Fin Dev |
| | .068 (.072) | .002** (.001) | .002 (.003) | .006** (.003) | .005 (.004) | .003 (.002) |
| Lagged concentration | .772*** (.082) | .728*** (.054) | .699*** (.081) | .757*** (.060) | .729*** (.080) | .723*** (.079) |
| Trade | -.055** (.023) | -.050*** (.018) | -.057*** (.020) | -.046*** (.017) | -.056** (.023) | -.056*** (.020) |
| Income per capita | -.015* (.008) | -.011** (.005) | -.013** (.006) | -.010** (.005) | -.010* (.006) | -.012* (.006) |
| Endowments | .006* (.004) | .005* (.003) | .005* (.003) | .005* (.003) | .005* (.003) | .006 (.004) |
| Terms of trade growth | .060*** (.022) | .062*** (.018) | .071*** (.020) | .057*** (.017) | .067*** (.003) | .065*** (.020) |
| Foreign direct investment | -.015** (.006) | -.015*** (.006) | -.017** (.007) | -.013*** (.005) | -.012** (.006) | -.015** (.006) |
| | | | | | | |
| Wald test | 3403.97 [.000] | 2672.57 [.000] | 2485.98 [.000] | 3642.18 [.000] | 2449.27 [.000] | 1870.17 [.000] |
| Hansen J-test | 2.12 [.347] | .55 [.759] | 1.23 [.539] | .95 [.380] | 1.73 [.422] | .81 [.669] |
| AR (1) errors | -4.29 [.000] | -4.06 [.000] | -3.91 [.000] | -4.01 [.000] | -4.10 [.000] | -4.06 [.000] |
| AR (2) errors | .92 [.357] | 1.22 [.224] | 1.24 [.217] | 1.24 [.215] | 1.24 [.217] | .081 [.669] |
| No. of observations | 931 | 946 | 947 | 949 | 946 | 905 |

Some observations

- Banking sector development forces countries to specialise in accordance with their existing comparative advantage
 - Jaud et al., 2012, Finance, comparative advantage and resource allocation
 - For them, this is a positive point: finance enforces an efficient export composition in line with domestic factor endowment