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## Internal Origins of External Imbalances

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**[Abstract]** Global imbalances increase greatly since mid-1990s. I propose that heterogeneous aggregate risks within countries play important roles in determining cross-country distribution of external imbalances. High aggregate risks simultaneously cause high saving rate and low investment rate, leading to net export. Empirical examination reveals that net export increases with inflation volatility and decreases with institutional democracy, measuring economic and political risks, respectively. Inflation volatility raises net export via depressing investment. Institutional democracy reduces net export via lowering saving. These effects are economically significant and persist after controlling for other factors including per capital income, budget balance, dependency ratio, and financial development.

**Key words:** Global imbalances; saving glut; financial crisis; financial development; systematic risks

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Figure 1 shows the time series of world aggregate trade deficit, current account deficit, international reserves, and net foreign assets, all as percentages of world GDP (1975-2007). All four time series are largely flat before 1996 but begin to increase quickly since then.<sup>2</sup> The message is clear: international trade and current account imbalances increase greatly since the Mexican Peso crisis (1994-1995) and Asian financial crisis (1997-1998), accompanied by corresponding increases in international reserves and net foreign assets.

Increasing dispersion in current accounts has received extensive attention from researchers and policy makers. Feldstein (1999), among others, emphasizes that the Asia financial crisis gives birth to strong self protection incentives. The worry about sudden stops and reversals of capital flow leads to excess accumulation of reserves as an insurance device (see also Dornbusch et al. (1995)). Advocates of the revived Bretton Woods system (Dooley et al. (2003, 2004), Cooper (2007)) argue that several major developing economies deliberately maintain undervalued currencies as a part of an export-led growth strategy. The financial integration theories propose that heterogeneity in financial development leads to capital flow from countries with less developed financial markets to countries with better developed financial markets (Willen (2004), Caballero, *et al.* (2008), Mendoza, *et al.* (2009)).

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<sup>2</sup> There is hike in international reserves around 1979 due to piling foreign reserves in OPEC countries during the second oil crisis. Otherwise the time series of international reserves is largely flat with a slightly downward trend until 1995.

The debate is intensified by the global financial crisis of 2007-2009. Obstfeld and Rogoff (2009) propose that global imbalances and the global financial crisis are intimately connected. Portes (2009) proposes that global imbalances create the macroeconomic conditions which generate the crisis jointly with flaws in financial markets. Bernanke (2005, 2009) blames deficits in the United States and the global financial crisis on “saving glut” of developing Asia and commodity exporters.

All these arguments have their ingredients of validity. However, they also leave unanswered questions. The sudden stop story does not explain why some well developed countries (e.g., Germany and Japan) run large trade surplus and some developing countries (e.g., Egypt, Poland, and Philippines) run large trade deficits. The revived Bretton Woods argument does not carefully investigate the incentive of periphery countries and how much the international macroeconomic environment has changed (Eichengreen (2004)). The financial integration theories are theoretically appealing. However, it is quiet on why global imbalances increases suddenly since the Asia financial crisis. It also implies that global imbalances represent a harmonious equilibrium in the context of financial globalization, which is not harmonious as demonstrated by the ongoing financial crisis. Another major explanation, which emphasizes on the special role of the United States in world economy, is insufficient to explain the cross country variation of imbalances. It is also quiet on why the dispersion grows suddenly since mid-1990s.

With all these unanswered questions, we still do not have a systematic understanding about the origins of global imbalances. Even if we combine all these explanations, we still do not have a systematic understanding of what types of countries run trade surpluses or deficits. This study extends existing analysis by searching for fundamental determinants of external imbalances in a globalized economy. Particularly, I explore the role of aggregate risks in determining cross country distribution of external surpluses and deficits.

The intuition can be clearly seen in the investment-saving analysis framework. A closed economy must be “externally” balanced, i.e., investment must be equalized to saving. However, it does not mean savings are efficiently invested. In an open economy, international diversification of savings is possible. The key implication is that saving and investments can be determined separately. If the aggregate risks of an economy are higher, saving rate should be higher to insure against the risks. On the other hand side, investment rate should be lower due to higher investment risks. *Ceteris paribus*, an economy of higher aggregate risks should have higher saving rate and lower investment rate. Consequently, it should have surplus in international trade.

The role of aggregate risks differs from heterogeneous financial development emphasized by Willen (2004), Caballero, *et al.* (2008), and Mendoza, *et al.* (2009). In these models, economies differ in their abilities of diversifying idiosyncratic risks or supplying safe assets. Aggregate risks are not considered. I propose that aggregate

risks play a different role in addition to that of financial development in affecting saving and investment. Economies differ in their aggregate risks after all idiosyncratic risks are diversified away. Even without idiosyncratic risks, an economy of higher aggregate risk will still have higher saving rate and lower investment rate, *ceteris paribus*. As will be seen soon, proxies for financial development actually do not enter significantly for the distribution of long term trade imbalances.

Aggregate risks relate to the self-protection incentive emphasized by Dornbusch et al. (1995) and Feldstein (1999). Economies of higher aggregate risk have stronger incentive to insure against sudden stops and reversals of capital inflows. Awaked of such risks by the Mexican Peso crisis and Asian financial crisis, such economies maintain positive trade surplus and accumulate more reserves. Aggregate risks also relate to the revived Bretton Woods argument. Countries with high aggregate risks are likely to maintain competitive exchange rates. However, the motivation is for self insurance.

I explore three dimensions of a country's aggregate risks: economic, legal, and political, proxied by inflation volatility, rule of law, and institutional democracy, respectively. Inflation volatility directly measures macroeconomic instability. Low inflation volatility should be associated with stable economic environment and clear economic expectations. Rule of law measures the extent to which "agents have confidence in and abide by the rules of society, and in particular the quality of

contract enforcement, the police, and the courts, as well as the likelihood of crime and violence” (Kaufmann, *et al.* (2008)). Institutional democracy measures the extent to which (a) political participation is unrestricted, open, and competitive; (b) executive recruitment is elective; and (c) constraints on the chief executive are substantial. These are essential elements of institutional democracy (Marshall and Jaggers (2010)). An economy of lower inflation volatility, better rule of law, and better institutional democracy is one in which economic expectations are clearer, rules are better followed, and political power are better constrained. Such an economy should have less aggregate risks and, *ceteris paribus*, should have lower saving rate and higher investment rate, resulting in net import rather than export.

Concerns over these fundamental variables, which describe stable properties of economies, lead us to examine long term imbalances. Imbalances in one year or few years are affected by short run shocks and dynamics, which can be averaged out across multiple years. Multiple year averages better reflect the underlying stable properties of economies. This consideration relates this study to earlier investigation of current account determinants in medium and long horizons (Chinn and Prasad (2003), Chinn and Ito (2007), Gruber and Kamin (2007)). These earlier studies facilitate my analysis by documenting a set of relevant variables, which this study can build upon. As a preview, the main empirical findings are as follows: after controlling for per capita GDP, trade openness, dependency ratio, budget balance, etc., net export decreases with institutional democracy and macroeconomic stability. Rule of law does not affect external

imbalances because it has similar effects on saving and investment rates.

## I. Data

I am mainly concerned with the dramatic increase of global imbalances since the Asian financial crisis. Global imbalances are a recent phenomenon after mid-1990s. Before mid-1990s dispersions in current accounts is stable at a small scale (Figure 1).<sup>3</sup> Therefore, I examine the average annual imbalances from 1997 to 2007. All variables are averaged over these years unless otherwise indicated. The lagged dependent variables are based on 1990-1996 average, and the lagged Net Foreign Assets (NFAs) are based on the year right before the period started. In cases of missing annual observations, averages were calculated based on the remaining years, allowing a larger sample of developing countries than would have otherwise been possible.

In the framework of investments and savings analysis, net export is the natural measure of external imbalance. As a comparison, I will also examine current account imbalance. The difference between these two measures is factor (labor and capital) incomes and current transfers, which do not enter directly into the identity of Gross Domestic Production (GDP). Across countries, these two components are negatively correlated with net export. The negative correlation coefficient is as high as -0.73,

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<sup>3</sup> Before 1997, international imbalance of payments is mainly a phenomenon for high income countries and oil exporters. On the deficit side we have the United States, United Kingdom, and Australia. On the surplus side we have Japan and Germany. Latin American's trade balance swings from deficit to surplus and again to deficit. Its current account is in deficit in most years, reflecting net outward factor payments. OPEC is a net exporter except for the several years in mid-1980s. However, its current account is largely in deficit since 1983.

reflecting global movements of labor, capital, and equipments in today's globalized economy. Countries import these factors export the product to international markets, increasing net export of final goods and services. Since net export is the main driver of external imbalance which is partly counteracted by factor incomes and current transfers, employment of net export facilitate the discovery of factors influencing external imbalance.

The main explanatory variables are inflation volatility, rule of law, and institutional democracy. Inflation volatility is the standard deviation of annual inflation rates, calculated as CPI percentage changes. This is a direct measure of macroeconomic risk. A related measure is inflation level. High inflation level may also relate to economic instability. However, high inflation level can also be due to high aggregate demand relative to supply. An economy may experience high inflation during the process of economic take off if production capacity lags behind rising demand. To take this possibility into consideration I include both the level and volatility of inflation in the regression. Annual inflation is from the World Development Indicator (WDI) database. Mean and standard deviations of annual inflation of 1997-2007 are calculated.

Rule of law is a composite index collected and compiled by the Worldwide Governance Indicators (WGI) project at the World Bank (Kaufmann, Kraay, and Mastruzzi (2008)). The indicator ranges from -2.5 to 2.5. A higher score indicates

better rule of law. Institutional democracy is a composite index compiled by the Polity IV project at the University of Maryland (Marshall and Jaggers (2010)). The final score ranges from 0 to 10. A higher score indicates better institutional democracy.

Earlier studies identify a set of variables that affect medium and long run balance of payments (Chinn and Prasad (2003), Chinn and Ito (2007), Gruber and Kamin (2007)). Among them, per capita income, fiscal balance, net foreign asset position, changes in output growth, dependency ratio, trade openness, and financial development seem to have a stable correlation with current account imbalances. I also include real exchange rate (the ratio of PPP conversion factor to official exchange rate) to explore possible effect of exchange rate. Although earlier studies usually do not find a significant effect of real exchange rate for trade balance, I still control for this important relative price variable.

Data sources are listed in Appendix 1. We are left with 99 countries for which all the variables have non-missing values, of which 32 are high income countries, 20 are upper middle income countries, 27 are lower middle income countries, 20 are low income countries, according to 2007 World Bank income group classification. The countries are listed in Appendix 2.<sup>4</sup>

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<sup>4</sup> The list does not include China, which has missing value for private credit. Private credit is not significant in the regression. If we exclude this variable to include China, the results do not change noticeably.

Table 1 summarizes the main variables. For each country, the time series average of each variable (standard deviation for inflation volatility) is calculated first. Cross sectional averages and standard deviations are then calculated for the whole sample and high, upper middle, lower middle, and low income countries. Income groups are based on World Bank 2007 income group classification.

The average net export and current account balance are negative. High income countries tend to have surpluses rather than deficits. This is because rich countries tend to have higher saving rate. Investment rate is approximately the same for high income, upper middle income, and lower middle income countries. Low income countries have lower investment rate, probably because of lack of savings for investment and lack of access to international capital markets. High income countries also tend to have higher trade openness, higher old dependency ratio, more net foreign assets (NFAs), more private credit, and higher (less undervalued) real exchange rate, higher level of institutional democracy, and better rule of law.<sup>5</sup> In contrast, the level and volatility of inflation do not display the monotonic decreasing pattern across income groups. High income countries have the lowest and least volatile inflation. Upper middle income countries have the highest and most volatile inflation. Lower middle and low income countries do not differ obviously.

## **II. Determinants of external imbalances**

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<sup>5</sup> Since many of these variables are correlated, I test for multicollinearity in regression analysis. Multicollinearity is not severe. Coefficient estimations are not biased or instable.

### **A. Aggregate risks and net export**

Table 2 reports the main regression results. To control for possible missed variables, I include the lagged dependent variable in each regression, which is calculated as the average of the dependent variable from 1990 to 1996. Regression (1) is the regression without measures of aggregate risks. In regressions (2) and (3) I add aggregate risk variables. Regressions (4) and (5) report the regression on the two components of net export: gross saving and investment rates. Regression (6) replaces net export by current account balance. All dependent variables are expressed as percentages of GDP.

Consistent with earlier findings, GDP per capita, old dependency ratio, government budget balance, and oil dummy are significantly associated with net export. The positive association of GDP per capita is understandable from high income countries' higher saving rate. The positive coefficient on the oil dummy states the simple fact that OPEC countries are net exporters. Old dependency ratio has a negative coefficient because old people save less, according to the life cycle theory of saving. This is confirmed in regressions (4) and (5).

Government budget balance has a positive sign, which should not be surprising. Budget balance represents government saving and net export represents aggregate saving of an economy. If an economy is a net saver at the aggregate level, it is not

surprising that its sectors (households, enterprises, and government) are also net savers, although the distribution of savings across sectors is a separate issue. It should be noted that such correlations do not say anything about the direction of the causal relationship.

Several other variables are insignificant in this regression, including trade openness, real exchange rate (RER), change in GDP growth rate ( $\Delta$ GDP), and private credit. Among them,  $\Delta$ GDP is negative and close to being significant. Higher GDP growth rate is usually accompanied by higher investment return and higher expectation for future income, investment rate should be higher and saving rate should be lower (which can be verified by regressions (4) and (5)), leading to lower and negative net export. It becomes significant after controlling for inflation level. This change reflects the negative correlation of  $\Delta$ GDP with inflation level (-0.28). When inflation level is absent, its negative effect on net export is absorbed by  $\Delta$ GDP via their negative correlation.

One major surprise comes from private credit, which is employed as a proxy for financial development and expected to have a negative sign. Although the sign is as expected, it is far from significant. Further analysis on saving and investment rates suggests that this is because financial development has similar effects on saving and investment rates (regressions (4) and (5)). That is, better financial development simultaneously decreases saving and investment rates. The decrease in saving rate is

understandable from the perspective of reduced precautionary saving (Willen (2004), Mendoza *et al.* (2009)). The decrease in investment rate may reflect the possibility that economies with better financial development have lower rates of investment returns.

It should be noted that insignificance of private credit in the regression does not necessarily mean that the theories of financial integration are invalid. An alternative explanation is that private credit is an imperfect proxy for financial development. I also explored alternative measures of financial development, stock market capitalization and money supply (M2). However, these two alternative measures do not generate better support for the prediction that better financial development leads to trade deficit. As a further effort, I also include legal origins as another proxy for financial development in regression (1). According to La Porta *et al.* (1998), English law is more prone to property rights and investor protection and thus friendly to financial development than French law, with German- and Scandinavian-civil-law countries located in the middle. Because we do not have a perfect proxy for financial development, I include legal origin as an indirect measure of financial development. However, coefficient estimation does not support that legal origins significantly affect net export.

In regression (2) I add average inflation, rule of law, and institutional democracy. Among these three variables, only institutional democracy is significant. Its sign is

negative, consistent with the expectation that economies with better institutions and procedures to support democracy have less aggregate risks and should, *ceteris paribus*, have lower saving rate and higher investment rate.

Rule of law is insignificant, lending no support to the expectation that an economy with better rule of law should have lower aggregate risks and be a net importer. Indirectly, this finding also lend no support to the argument of financial development since better rule of law should be associated with better financial development. In this regard the insignificance of rule of law is consistent with the insignificance of private credit and legal origin dummies. Further analysis on saving and investment rate suggests that better rule of law lead to higher investment rate (regression (5)), as expected. However, the saving rate also tends to be higher (regression (4)), counteracting the effects on investment.

The insignificance of inflation level seems disappointing at the first sight. However, it is not surprising since inflation level relates not only to economic instability but also to the gap between aggregate supply and aggregate demand. In regression (3), I further add inflation volatility. It turns out that inflation volatility is significantly positive and inflation level becomes significantly negative. The interpretation is intuitive: the former captures economic instability while the latter captures the supply demand gap. Further analysis on saving and investment suggests that higher inflation mainly depresses savings while unstable inflation mainly

depresses investment (regressions (4) and (5)). That is, saving is lower when inflation is higher, intuitively due to the lower real interest rate, while investment is lower when inflation is more volatile, intuitively due to higher inflation risks.

Economic significance of these results is visualized in Figures (2)-(4), which produce the partial plots of net export with inflation level, inflation volatility, and institutional democracy based on regression (3). After controlling for other variables, the obvious correlation of inflation level, inflation volatility, and institutional democracy with net export can be clearly seen. If inflation level, inflation volatility, and institutional democracy change by one standard deviation (6.7%, 6.1%, and 3.4%, respectively), net export will change by 3.0%, 2.9%, 2.3%, respectively. These are large changes as compared to the average net export of -3.0% and the standard deviation of 11.7%.

In regression (6) I replace net export by current account balance as the dependent variable. Otherwise regression (6) is identical with regression (3). For most variables the parameter estimations become smaller in absolute value, accompanied by decreased significance. This change reflects the negative correlation between net export and the other components of current account balance, factor payments and current transfers. One exception is the coefficient on Scandinavian legal origin dummy becomes positive and significant. This reflects the rich external wealth positions and the accompanied investment income of northern Europe countries

(Norway, Denmark, Sweden, Iceland, and Finland).

## **B. Robustness**

Table 3 checks the robustness of the results. Regressions (1)-(4) reporting the regression results on subsets of countries by excluding low income, high income, high and low income, low and lower middle income countries. Regression (5) reports the regression with 1999-2006 average net export as the dependent variable. The purpose is to check whether the results in Table 2 are driven by abnormal crisis time (1997-1998 and 2007). That is, years of financial crisis are excluded.

The variables of main concern, inflation level, inflation volatility, rule of law, and institutional democracy all remain their sign and significance. Noticeable changes include 1) old dependency ratio becomes insignificant when low and lower middle income countries are excluded, possibly due to the smaller variation within high and upper middle income countries. 2) Real exchange rate (RER) becomes significant when high income countries are excluded. The coefficient estimation decreases further from -30.51 to -43.55 when low income countries are also excluded. In comparison, it remains insignificant when low income or low and lower middle income countries are excluded. It seems that exchange rate matters for middle income countries but not for high or low income countries. 3) Lagged net foreign assets (NFAs) become significant in regressions (2) when high income countries are excluded and (5) when crisis years are excluded. This reflects the fact that developing

economies usually has small or even negative foreign assets (NFAs) before the Asian financial crisis but begin to accumulate net export since then. The pattern is less clear when high income countries are included because of the higher dispersion of high income countries.

In addition, a set of other variables are examined as possible determinants of external imbalances, including terms of trade volatility and youth dependency ratio (percentage of people below age 16). Either of them is significant. Youth dependency ratio is highly negatively correlated (-0.87) with old ratio so it is excluded to avoid multicollinearity. I also examined volatility of GDP growth rate as another measure of macroeconomic stability but it is not significant. In the Worldwide Governance Indicator (WGI) database, I also examined voice and accountability (of participation in government selection, freedom of expression, freedom of association, etc.), political stability and absence of violence/terrorism, government effectiveness, regulatory quality, control of corruption. In addition, I also examined government size based on the consideration that a large government may be a potential threat to markets as the mechanisms of resource allocation and a potential source of aggregate risks (Hayek (1960), La Porta et al. (1998)). None of them are stably significant, though.

### **III. Concluding Remarks**

Motivated by the increasing global imbalances since mid-1990s, I study the cross

sectional distribution of external imbalances within the saving-investment analysis framework. I propose that aggregate risks within countries help determine its external imbalances in a globalized economy. *Ceteris paribus*, higher aggregate risks raise saving rate to insure against future uncertainties and reduce investment rate because investments become riskier. I explore three dimensions of aggregate risks, economic, legal, and political, proxied by inflation volatility, rule of law, and institutional democracy. Inflation level, inflation volatility, and institutional democracy are found to help explain net export in addition to income, dependency ratio, budget balance, and change in GDP growth rate. Rule of law has similar effects on saving and investment which counteract each other.

Overall, these findings suggest that external imbalances reflect different income levels, demographic structure, growth rate, economic stability, and institutional democracy across countries. These factors affect external imbalances via their effects on domestic saving and investment rates. Imbalances emerge when inequality become possible in a globalized economy where agents can diversify their investments across country borders. In this sense, these findings echo Bini Smaghi's (2008) statement that "external imbalances are often a reflection ... of internal imbalances."

These findings cast light on the debate about how to resolve external imbalances. Policy recommendations on resolving external imbalances must take domestic social and economic constraints into consideration. Relaxing such constraints creates the

pre-conditions for external rebalancing and constitutes the ultimate solution. Developing countries with higher aggregate risks need a credible insurance against future uncertainties, including sudden stops and reversals of capital flows. A stable macroeconomic environment, especially stable and well grounded monetary policy, helps reduce excess saving and encourage investment. Improvements in domestic institutional infrastructures are critical before external imbalances can be effectively reduced.

## Appendix 1: Data Sources

Variable	Data Source	Variable Description
Net export	WDI	% of GDP
Current account	WDI	% of GDP
Saving	WDI	GDP less total consumption, % of GDP
Investment	WDI	Gross capital formation, % of GDP
GDP per capita	WDI	Constant 2000 USD.
Total trade	WDI	Total import and export as % of GDP -
Old ratio	WDI	People aged 65 or above as % of total population
Oil dummy	OPEC website	Dummy variable based on OPEC membership
RER	WDI	Ratio of PPP conversion factor to market exchange rate
NFA	EWN	Net foreign assets as % of GDP
Budget balance	WDI	Government budget balance as % of GDP
$\Delta$ Growth	WDI	Change of GDP growth rate from last period
Private credit	FinStructure	Private credit by deposit money banks and other financial institutions as % of GDP
Democracy	Polity IV	Composite index (0-10) of institutionalized democracy
Law	WGI	Rule of law rating from the perspective of the efficiency of judicial system, property rights protection and etc.
CPI	WDI	Consumer price index (annual %)

*Note:* WDI: World Development Indicator; EWN: Updated and extended version of the External Wealth of Nations Mark II database developed by Lane and Milesi-Ferretti (2007); FinStructure: Thortsen Beck and Asli Demirgüç-Kunt, "Financial Institutions and Markets Across Countries and over Time: Data and Analysis", World Bank Policy Research Working Paper No. 4943, May 2009 ; WGI: Daniel Kaufmann, Aart Kraay and Massimo Mastruzzi (2008), "Governance Matters VII: Governance Indicators for 1996-2007". World Bank Policy Research; Polity IV: Polity IV project, Marshall and Jaggers (2010).

## **Appendix 2: Country list**

**High income countries (32):** Australia; Austria; Bahrain; Belgium; Canada; Czech Republic; Denmark; Estonia; Finland; France; Germany; Greece; Hungary; Ireland; Israel; Italy; Korea, Rep.; Kuwait; Netherlands; New Zealand; Norway; Oman; Portugal; Singapore; Slovak Republic; Slovenia, Spain; Sweden; Switzerland; Trinidad and Tobago; United Kingdom; United States

**Upper middle income countries (20):** Argentina; Brazil; Bulgaria; Chile; Croatia; Fiji; Kazakhstan; Latvia; Lithuania; Malaysia; Mauritius; Mexico; Panama; Poland; Romania; Russian Federation; South Africa; Turkey; Uruguay ;Venezuela, RB

**Lower middle income countries (27):** Albania; Armenia; Bolivia; Cameroon; Colombia; Congo, Rep.; Dominican Republic; Egypt, Arab Rep.; El Salvador; Guatemala; Honduras; India; Indonesia; Iran, Islamic Rep.; Lesotho; Macedonia, FYR; Moldova; Mongolia; Morocco; Paraguay; Peru; Philippines; Sri Lanka; Sudan; Swaziland; Thailand; Tunisia

**Low income countries (20):** Bangladesh; Benin; Burkina Faso; Burundi; Cambodia; Cote d'Ivoire; Ethiopia; Ghana; Kenya; Kyrgyz Republic; Madagascar; Mali; Niger; Pakistan; Papua New Guinea; Senegal; Togo; Uganda; Yemen, Rep.; Zambia

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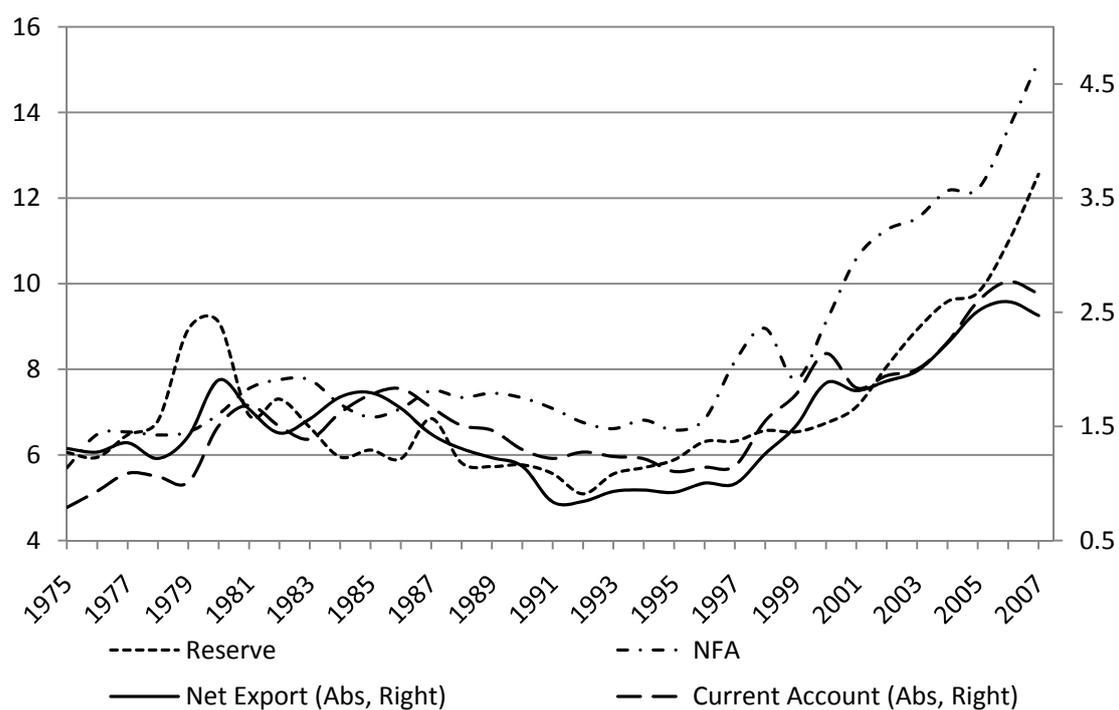
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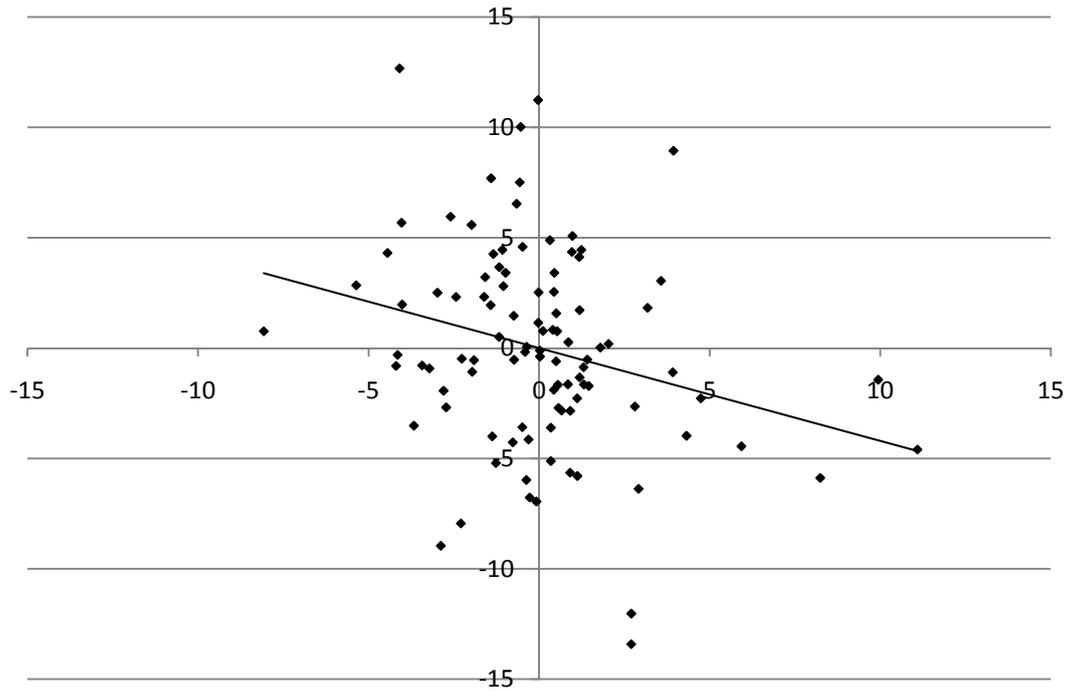
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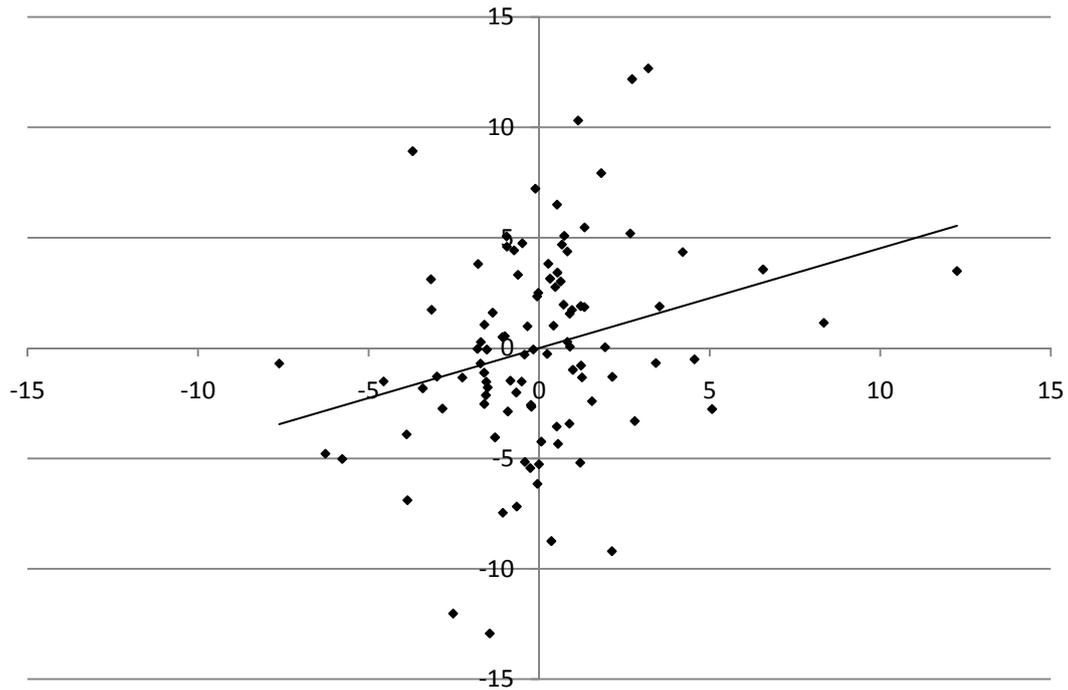
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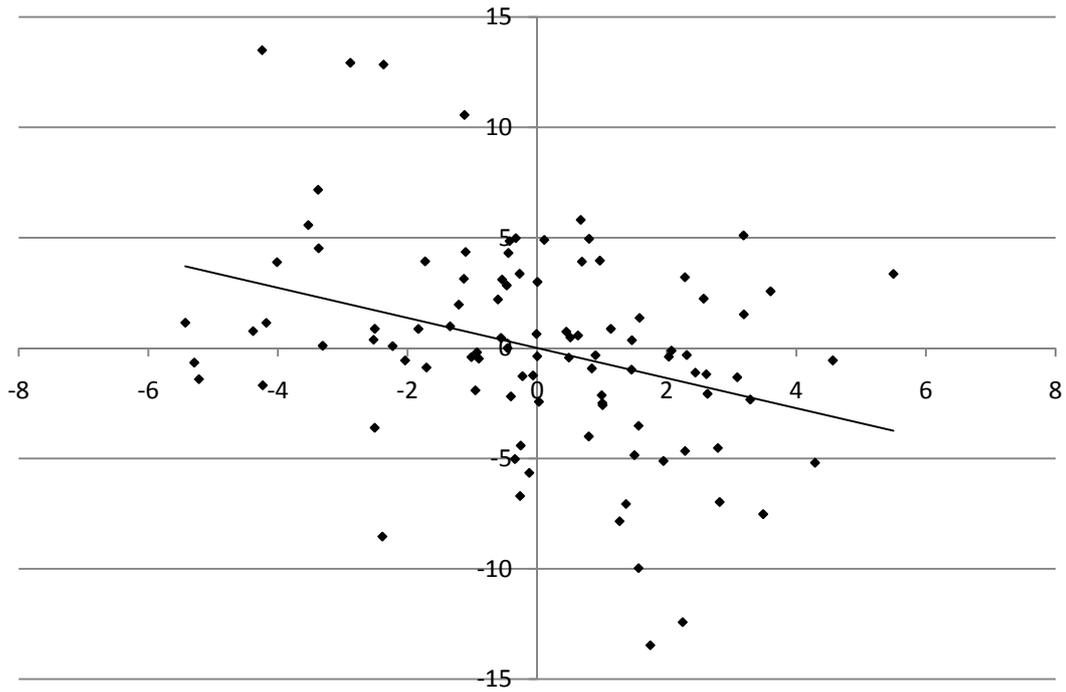
**Figure 1: External imbalances increases greatly since the Asian financial crisis.** This figure plots the time series of world aggregate trade deficit, current account deficit, international reserves, and net foreign assets, all as percentages of world GDP from 1975 to 2007.



**Figure 2: Partial correlation between net export and inflation.** Average inflation (1997-2007) is negatively correlated with net export after controlling for income, trade openness, old dependency ratio, exchange rate, lagged net foreign assets, government budget balance, change in growth rate, private credit, inflation volatility, rule of law, and institutional democracy. All data are 1997-2007 averages.



**Figure 3: Partial correlation between net export and inflation volatility.** Inflation volatility (1997-2007) is positively correlated with net export after controlling for income, trade openness, old dependency ratio, exchange rate, lagged net foreign assets, government budget balance, change in growth rate, private credit, average inflation, rule of law, and institutional democracy. All data are 1997-2007 averages.



**Figure 4: Partial correlation between net export and institutional democracy.** Institutional democracy is negatively correlated with net export after controlling for income, trade openness, old dependency ratio, exchange rate, lagged net foreign assets, government budget balance, change in growth rate, private credit, average inflation, inflation volatility, and rule of law. All data are 1997-2007 averages.

**Table 1: Summary Statistics**

This table reports the mean and standard deviation of main variables in the analysis. For each country time series averages (1997-2007) of each variable and standard deviation of annual CPI percentage changes are calculated first. The averages and standard deviations are then averaged across the total sample (99 countries), high income countries (32), upper middle countries (20), lower middle countries (27), and low income countries (20). Country group is based on 2007 World Bank classification. Old ratio is the percentage of population older than 65. NFA is net foreign assets (% GDP).  $\Delta$ Growth is the difference between the average GDP growth for the 1997-2007 period and for the 1990-1996 period. Private credit is credit provided by deposit money banks and other financial institutions as % of GDP. Real exchange rate is the ratio between PPP conversion factor and official exchange rate.

	All		High Income		Upper Middle		Lower Middle		Low Income	
	Mean	Std.	Mean	Std.	Mean	Std.	Mean	Std.	Mean	Std.
Net export (% GDP)	-2.95	11.70	3.72	8.31	-0.14	7.79	-8.39	14.94	-9.11	7.83
CA balance (% GDP)	-1.57	6.34	1.60	7.93	-2.00	5.71	-2.51	4.18	-4.93	4.25
Saving (% GDP)	18.96	11.83	26.40	7.85	21.68	8.24	14.88	14.12	9.85	8.28
Investment (% GDP)	21.94	4.51	22.69	3.83	21.96	3.22	23.27	5.41	18.92	4.17
GDP per capita (2000 \$)	7499	9816	19273	9273	4117	1689	1349	693	342	152
Total trade (% GDP)	85.47	50.82	101.18	68.12	84.26	44.18	82.99	39.50	64.91	28.17
Old ratio (%)	8.15	5.24	12.94	4.62	9.30	4.66	5.44	2.15	3.01	0.77
NFA (% GDP)	-37.95	56.02	-4.85	52.39	-24.01	17.85	-53.71	54.26	-83.60	52.58
Budget balance (% GDP)	-0.79	3.36	0.22	4.01	-0.88	2.23	-1.36	2.64	-1.55	3.86
$\Delta$ Growth	1.96	4.67	1.23	3.41	3.45	6.51	2.00	5.16	1.62	3.35
Private credit (% GDP)	48.55	42.35	90.71	39.31	41.75	34.08	29.24	22.36	13.97	7.25
Real exchange rate	0.56	0.27	0.85	0.28	0.52	0.11	0.40	0.07	0.37	0.06
CPI (mean)	6.41	6.67	2.82	1.75	10.55	11.44	7.12	4.20	7.04	5.30
CPI (std.)	4.39	6.05	1.57	1.53	7.98	11.08	5.00	4.45	4.49	2.71
Rule of law	0.11	0.97	1.26	0.51	0.02	0.64	-0.55	0.47	-0.75	0.37
Institutional democracy	6.55	3.43	8.62	3.17	7.54	2.37	5.45	3.36	3.72	2.17

**Table 2: Determinants of external imbalances**

This table reports the regression results. The dependent variables are net export, gross saving, gross investment, or current account balance (CA), all expressed as percentages of GDP. All dependent variables are averaged across 1997-2007. There are 99 countries for which all variables have data. Robust *t* statistics adjusted for heteroscedasticity are in parentheses. \*, \*\*, \*\*\* denote significance at 10%, 5%, and 1%, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Net Export	Net Export	Net Export	Saving	Investment	CA
Constant	-25.67*** (-3.95)	-24.94*** (-3.77)	-24.99*** (-3.98)	-16.97** (-2.39)	11.71*** (3.49)	-14.53*** (-2.82)
GDP per capita (log)	4.166*** (4.49)	4.540*** (4.95)	4.664*** (5.25)	4.887*** (4.25)	0.361 (0.84)	2.277*** (3.05)
Total trade (% GDP)	0.0214 (1.54)	0.0127 (0.90)	0.0119 (0.89)	0.000147 (0.01)	0.00140 (0.24)	0.0124 (1.33)
Old ratio (%)	-0.671*** (-3.11)	-0.372* (-1.68)	-0.453** (-2.26)	-0.617*** (-2.88)	-0.120 (-0.99)	-0.306 (-1.66)
Oil dummy	5.852** (2.10)	4.809* (1.90)	6.597*** (2.99)	8.536*** (3.12)	3.412* (1.79)	4.401** (2.22)
RER	-5.402 (-1.06)	-6.433 (-1.30)	-6.614 (-1.41)	-4.351 (-0.87)	-1.904 (-0.93)	-1.949 (-0.43)
Lagged NFA (% GDP)	-0.0154 (-0.77)	-0.0178 (-1.05)	-0.0228 (-1.39)	-0.0333** (-2.03)	-0.0139** (-2.53)	0.00602 (0.45)
Budget balance (% GDP)	0.403** (2.04)	0.450** (2.41)	0.387** (2.30)	0.194 (1.27)	-0.106 (-1.23)	0.272* (1.95)
ΔGrowth	-0.334 (-1.61)	-0.394** (-2.18)	-0.367** (-2.02)	-0.0509 (-0.24)	0.258*** (3.67)	-0.212 (-1.62)
Private credit (% GDP)	-0.0117 (-0.53)	-0.00458 (-0.19)	-0.00339 (-0.14)	-0.0470** (-2.23)	-0.0272** (-2.31)	0.0250 (1.08)
CPI (mean)		-0.0480 (-0.56)	-0.443*** (-2.92)	-0.321* (-1.92)	0.126 (1.25)	-0.0176 (-0.14)
CPI (std.)			0.482*** (3.02)	0.207 (1.17)	-0.214* (-1.93)	0.0439 (0.35)

Rule of law		-0.426 (-0.32)	-0.412 (-0.33)	1.208 (0.99)	1.911*** (2.93)	-1.389 (-1.46)
Institutional democracy		-0.723*** (-3.05)	-0.683*** (-2.97)	-0.640** (-2.56)	0.102 (0.80)	-0.406** (-2.18)
Legal origin (Scan)	2.213 (0.92)	2.230 (0.92)	2.307 (1.02)	0.489 (0.22)	-1.656 (-0.96)	6.520** (2.54)
Legal origin (France)	-0.159 (-0.12)	-0.368 (-0.30)	-0.821 (-0.67)	-1.423 (-0.98)	-0.712 (-0.98)	0.629 (0.55)
Legal origin (Germany)	-0.00628 (-0.00)	0.484 (0.23)	0.578 (0.29)	2.200 (0.92)	1.661 (1.51)	0.725 (0.38)
Lagged dependent	0.617*** (18.64)	0.596*** (19.89)	0.625*** (19.93)	0.665*** (7.39)	0.409*** (9.25)	0.388** (2.33)
Adj. $R^2$	0.796	0.819	0.831	0.808	0.649	0.650

**Table 3: Subsample analysis and excluding crises time**

This table reports the regression results. The dependent variables are average net export as percentage of GDP from 1997 to 2007 unless otherwise indicated. Income groups are based on 2007 World Bank classification. Robust  $t$  statistics adjusted for heteroscedasticity are in parentheses. \*, \*\*, \*\*\* denote significance at 10%, 5%, and 1%, respectively.

	(1)	(2)	(3)	(4)	(5)
	No low income	No high income	No high or low income	No low and lower middle	1999-2006
Constant	-24.39** (-2.01)	-27.60*** (-4.16)	-39.83*** (-3.18)	-24.91 (-1.38)	-31.32*** (-4.91)
GDP per capita (log)	4.673*** (2.94)	7.043*** (4.09)	10.29*** (3.68)	4.280* (1.95)	5.675*** (6.22)
Total trade (% GDP)	0.00941 (0.60)	0.00848 (0.39)	0.00316 (0.13)	0.0170 (1.07)	0.0176 (1.28)
Old ratio (%)	-0.457* (-1.96)	-0.796* (-1.94)	-1.021* (-2.00)	-0.391 (-1.50)	-0.591*** (-2.87)
Oil dummy	7.142*** (3.17)	3.910* (1.89)	4.887* (1.99)	7.109** (2.44)	9.031*** (3.24)
RER	-7.473 (-1.32)	-30.51*** (-3.10)	-43.35*** (-2.98)	-2.840 (-0.45)	-7.572 (-1.28)
Lagged NFA (% GDP)	-0.0214 (-0.94)	-0.0376** (-2.08)	-0.0356 (-1.14)	-0.0253 (-1.07)	-0.0280** (-2.07)
Budget balance (% GDP)	0.396* (1.69)	0.547** (2.44)	0.811* (1.94)	0.370 (1.53)	0.297** (2.09)
$\Delta$ Growth	-0.335 (-1.54)	-0.290 (-1.39)	-0.194 (-0.76)	-0.204 (-0.87)	-0.285 (-1.11)
Private credit (% GDP)	-0.00166 (-0.06)	-0.0200 (-0.50)	-0.0530 (-1.03)	0.0184 (0.62)	-0.00542 (-0.21)
CPI (mean)	-0.543*** (-2.82)	-0.552** (-2.68)	-0.748** (-2.37)	-0.403** (-2.28)	-0.489** (-2.15)
CPI (std.)	0.581*** (3.03)	0.589*** (2.72)	0.747** (2.52)	0.459** (2.07)	0.642* (1.82)

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Rule of law	0.0957 (0.06)	0.330 (0.21)	1.477 (0.93)	-1.185 (-0.73)	-0.524 (-0.41)
Institutional democracy	-0.736*** (-2.70)	-0.563** (-2.05)	-0.670** (-2.12)	-1.077** (-2.63)	-0.773*** (-3.09)
Legal origin (Scan)	2.376 (0.89)	---	---	3.867 (1.34)	2.335 (0.97)
Legal origin (France)	-0.428 (-0.25)	-2.967 (-1.55)	-5.401* (-1.82)	2.120 (1.11)	-1.040 (-0.71)
Legal origin (Germany)	0.763 (0.33)	-2.705 (-0.76)	-5.067 (-1.12)	1.513 (0.68)	-0.0905 (-0.04)
Lagged dependent	0.625*** (15.09)	0.651*** (17.18)	0.642*** (12.75)	0.537*** (4.09)	0.609*** (12.95)
<i>N</i>	79	67	47	52	99
Adj. <i>R</i> <sup>2</sup>	0.822	0.803	0.806	0.743	0.804

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