Session 1

Macroeconomic Effects of Foreign Aid: An Overview

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- Policy issues.
- Empirical evidence.
- Appendix I—Mechanics of sterilization.
- Appendix II—Aid and growth.
Policy Issues

Six issues:

1. Impact of aid inflows on real exchange rate, competitiveness, and export sector (more generally, allocative effects on the structure of production and consumption).

2. Impact of foreign aid on growth (aid a way to “escape” from a poverty trap: discussed in Session 2).

3. Fiscal impact through incentive effects; also indirect effect on growth…

…through public savings and investment—and therefore possibly private savings and investment as well (through crowding-out effects).

4. Impact of high and volatile aid inflows on fiscal management.

5. Monetary policy response to large aid inflows (mostly covered in Appendix).

6. Impact of aid inflows on the recipient’s ability to manage (absorptive capacity problem).
Dutch disease effect

- Argument: if aid is at least partially spent on nontraded goods, it may put upward pressure on domestic prices and lead to a real exchange rate appreciation.

- Mechanism through which the price of nontradable goods increases:
  - To make local purchases, foreign exchange needs to be converted into local currency; this expands the monetary base.
  - Expansion in money supply fuels an increase in domestic demand, which is partly met by higher imports.
  - With supply constraints on domestic production: prices of nontradables (and overall price level) increase.
  - With a fixed exchange rate, the increase in prices leads to a real appreciation.
  - With a flexible exchange rate, the increased supply of foreign currency, not fully absorbed by higher imports, would lead to a nominal appreciation of the domestic currency.

- In turn, real appreciation may induce a reallocation of labor toward the nontraded goods sector…
- …thereby raising real wages in terms of the price of tradables.
Deterioration in competitiveness may lead to a decline in export performance (and adverse effect on growth).

Effect will occur regardless of whether aid is delivered in the form of projects or as direct budget support...

...and regardless of whether the aid is transferred through the government's budget or through grants to the private sector.

Magnitude of the effect will be stronger the greater the share of nontradable goods in domestic consumption...

...and the lower the ability (or willingness) of consumers to switch from domestic to imported goods (as is the case in the short run).

If the export sector is a sector where large productivity effects are recorded: the real appreciation may undermine the dynamic gains from aid, and the export sector (which may already be low) will shrink further.

Effect is altogether absent if aid is entirely spent on imports; BOP would be unchanged; increase in imports would be financed entirely financed by capital inflow...

...with no direct impact on money supply or aggregate demand (however, possible supply-side effect, depending on composition of imports).

Rare scenario in practice.
However: various factors can mitigate or offset the initial change in relative prices and mitigate the impact of real appreciation on exports.

1. Even with an appreciating currency, exports can increase if at the same time policies aimed at lowering trade barriers are implemented (e.g. lower export taxes, lower transaction costs).

2. The aid-induced inflow of imported goods may have a deflationary impact by increasing total domestic supply of goods, or by easing supply bottlenecks.

3. Higher aid (if it is not fully spent and if taxes don’t fall in an offsetting way) may reduce domestic borrowing needs…

…this may lead to a **crowding-in effect** on private activity and investment, through the relaxation of credit constraints.

4. Real appreciation may stimulate private investment because it lowers the *price of imported capital goods*…

…In turn, with higher imports of capital goods, a positive supply-side effect will develop over time, putting downward pressure on prices.

5. In a dynamic context, effect of aid on the real exchange rate depends on how quickly aid-financed spending affects the productive capacity (supply-side) of the economy.

If foreign aid eases supply bottlenecks, it can have a deflationary impact, which may exceed the demand-side effect; the real exchange rate can depreciate.
Case if e.g. there is learning by doing (that is, endogenous productivity gains) and learning spillovers between production sectors, or if aid has a direct effect on public investment in infrastructure.

Indeed, if aid is used to finance public investment: supply-side effects either directly through public production (services) or private production (complementarity effect on private investment).

Thus, net effect: in general ambiguous.

Effects on Growth

Best viewed in the context of the new endogenous growth theories.

Depends on whether aid is permanent or temporary (should not be spent on permanent programs).

Aid may influence growth to the extent that it is used to add to human capital.

Also health and infrastructure (Sessions 3 and 4).

But at high levels, aid may exhibit decreasing marginal returns (Aid Laffer curve).

Lensink and White (2001): government expenditure has a systematic, and nonlinear, effect on steady-state growth rates.

To the extent that aid leads to an increase in government spending—and hence production of public services—it will have a positive effect on the recipient’s steady-state growth rate.
• However, this effect operates only at low levels of aid; beyond a certain threshold, aid has a negative impact on growth.

• Reason: aid-financed government expenditure may exert diminishing returns on private production, perhaps because of congestion effects.

• See Session 3.

• Note: large increase in aid (Big Push) can help a country escape from a poverty trap (Session 2).

Fiscal Impact through Incentive Effects

• Fiscal response models: used to examine the impact of aid on taxes and government expenditure (both level and composition), that is, the degree of fungibility of aid.

• See articles on CD.

• An increase in aid may lead to a decline in public savings through lower tax revenues, as governments reduce their tax collection effort.

• Typical results:
  • aid is used to finance lower taxes and borrowing from domestic sources;
  • it tends to be spread among various expenditure categories.

• Important limitation: models fail to take into account general equilibrium effects—e.g., impact of aid on aggregate income, an thus indirect impact on tax revenue. See Session 4.
Aid Volatility and Fiscal Policy

- Other policy challenge of heavy reliance on foreign aid: volatility of these flows.
- Bulir and Hamann (2003): aid (ODA) is significantly more volatile than domestic fiscal revenue--up to 7 times in the case of heavily-dependent countries.
- See Table. Note: this is not the case for Ethiopia.
- Volatility of aid increases with the degree of aid dependency.

- This leads to increase in fiscal uncertainty, making long-term planning more difficult.
- Also: aid volatility may significantly attenuate the positive effect of aid on growth.
- Case e.g. for public investment/donor-financed recurrent maintenance expenditure; adverse effect on the supply side.
- Welfare consequences of higher volatility can be quite high.

### Table 1. Relative Volatility of Aid and Revenue (Φ)

<table>
<thead>
<tr>
<th>Variables expressed in percent of GDP</th>
<th>Subsample 1 (ratio larger than 50 percent)</th>
<th>Subsample 2 (ratio larger than 50 percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>9.96***</td>
<td>4.96***</td>
</tr>
<tr>
<td>Median</td>
<td>1.10</td>
<td>2.19***</td>
</tr>
<tr>
<td>Variance</td>
<td></td>
<td>4.91***</td>
</tr>
<tr>
<td>Frequency indicators</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample size</td>
<td>72</td>
<td>87</td>
</tr>
<tr>
<td>Number of countries where Φ &gt; 1</td>
<td>57</td>
<td>57</td>
</tr>
<tr>
<td>Number of countries where Φ &gt; 1</td>
<td>57</td>
<td>57</td>
</tr>
<tr>
<td>Aid-to-revenue ratio (in percent)</td>
<td>76.4</td>
<td>85.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variables expressed in U.S. dollars per capita</th>
<th>Subsample 1 (ratio larger than 50 percent)</th>
<th>Subsample 2 (ratio larger than 50 percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>1.33***</td>
<td>1.73***</td>
</tr>
<tr>
<td>Median</td>
<td>0.86</td>
<td>0.80</td>
</tr>
<tr>
<td>Variance</td>
<td></td>
<td>0.25***</td>
</tr>
<tr>
<td>Frequency indicators</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample size</td>
<td>72</td>
<td>35</td>
</tr>
<tr>
<td>Number of countries where Φ &gt; 1</td>
<td>33</td>
<td>33</td>
</tr>
<tr>
<td>Number of countries where Φ &gt; 1</td>
<td>33</td>
<td>21</td>
</tr>
<tr>
<td>Aid-to-revenue ratio (in percent)</td>
<td>64.5</td>
<td>83.1</td>
</tr>
</tbody>
</table>

Source: Bulir and Hamann (2003).
Bulir and Hannan (2003); aid also tends to be (weakly) pro-cyclical; instead of smoothing out cyclical shocks, it tends to exacerbate them.

See Figure. However, results are not statistically robust.

Volatility may be mitigated by using official reserves as a buffer to respond to aid shortfalls and finance the fiscal deficit (see below).
Monetary Management of Aid Inflows

- Aid volatility (see above) may significantly attenuate the positive effect of aid on growth.

- Volatility may be mitigated by using official reserves as a buffer to respond to aid shortfalls and finance the fiscal deficit.

- Problem: may interfere with monetary policy objectives. Country may not be able to sell sufficient foreign exchange if the market is too narrow and this may lead to inflationary pressures.

- Effective monetary management requires the central bank to have sufficient capacity to conduct sterilization operations.

- See Appendix for the mechanics of sterilization.

- Note also: sterilization implies higher domestic debt and higher interest rates (through risk premium). This could have an adverse effect on activity and private investment.

- If aid is monetized, but there is an overall ceiling on credit expansion (e.g. IMF program): cut in credit by central bank can have an adverse effect on private production and investment.

- In effect, the government would crowd out the private sector with aid flows.

- Aid could also crowd out private investment if the government tries to contain a real exchange rate appreciation through tight monetary policies to counteract the aid-financed increase in aggregate demand.
• Instability in the exchange rate and/or interest rates: may be undesirable from a macro perspective, particularly in an economy with underdeveloped financial markets.

• Could jeopardize achievement of an inflation target.

• Unless short-run deviations from this target are acceptable, short-term accumulation of reserves may actually be an efficient way to manage large (and temporary) inflows of aid.

• Other option is to disburse aid inflows gradually, to avoid excessive fluctuations in domestic interest rates and the exchange rate.

• Particularly important if inflows are temporary.

• But this requires fiscal control; difficult to determine whether aid flows are temporary or permanent.

• Hard to determine also how much the “equilibrium” appreciation should be (and thus the path of the nominal exchange rate).

**Aid and Absorption Capacity**

• If foreign assistance may have adverse effects on incentives to collect taxes and keep public expenditure under control (see above), or engage in reforms that may be politically costly…

• …the issue of how to manage large aid flows becomes important.

• Large inflows of aid can overwhelm the management capacity of governments and create absorption problems.
Lack of a good administrative infrastructure implies that the recipient country may be unable to use additional aid efficiently…

...and this may lead to waste and congestion externalities.

Example 1: Botswana.

- Anti-AIDS program: started 4 years ago with committed contributions from the Gates and the Merck Foundations, of $50m each.

- But so far only half this money has been allocated, and only 70% of that has actually been spent.

- Capacity constraints prevent wise and useful deployment of more resources.

Example 2: PEPFAR.

- US. President’s Emergency Plan for Aids Relief (voted in 2003).

- Offers $15bn. over 5 years.

- Most of it spent in 15 countries, mainly in sub-Saharan Africa (and Yemen).

- Concerns (see July AIDS Conference in Bangkok): amounts being disbursed are so large that they may overrun local capacity in some countries.
Empirical Evidence

- Dutch disease (sub-Saharan Africa).
- Monetary response (effectiveness of sterilization).
- Aid and growth.

Dutch Disease

- Net effect: in general ambiguous.
- Evidence of Dutch disease effects for Burkina Faso, Côte d’Ivoire, Senegal, and Togo for period 1980-93 (Adenauer and Vagassky (1998)).
Example 1: Tanzania.

- Figure: difficult to interpret (simple correlations can be misleading).
- However, precise mechanisms are not identified (reduced-form regressions).

Tanzania
Real Effective Exchange Rate (left, 1990 = 100) and Aid (in percent of GDP)

Source: Bulir and Lane (2002).
Note: A rise in the real exchange rate is an appreciation.

Tanzania: Exchange Rates

Figure II.7. Tanzania: Exchange Rates, January 1997–July 2002
(1995=100, foreign currency per Tanzania shilling)

Note: A rise in the real exchange rate is an appreciation.
Example 2: **Uganda.**

- Aid flows increased sharply in the second half of the 1990s, reaching 10% of GDP in 2001-02 (grants: 5% of GDP).

- Central Bank faced a trade-off between selling foreign exchange or treasury bills (to commercial banks) to sterilize these inflows.

- Both instruments were used, so the country recorded both a real (and nominal) appreciation and higher domestic interest rates.

Heller and Gupta (2002) argued that both had a negative effect on growth--the real appreciation hurt competitiveness and exports...

...and selling (risk-free) government securities crowded out private sector credit; higher interest rates also hurt producers.

But important to distinguish between short- and longer-run effects, when *supply-side effects* start "kicking in" (see earlier discussion).

Simulation study by Adam and Bevan (2002).

- a 10% increase in aid from levels prevalent in 2000 and sustained over the medium term would appreciate the real exchange rate in the short run (1 or 2 years), resulting in a drop in exports of 5%...

- ...but over the medium term (3 to 5 years), export growth would exceed pre-aid levels by between 3% in a low-productivity scenario, and around 9% in a high-productivity.

- Dutch disease is a short-lived phenomenon.
Example 3: Ghana.

Sackey (2001): aid flows led to a real depreciation during the period 1962-96.

Possible reason: strong supply-side effects resulting from the allocation of a large fraction of aid to public investment in infrastructure

See table.

<table>
<thead>
<tr>
<th>Year</th>
<th>Aid/ODP</th>
<th>Aid/GDP</th>
<th>Aid/Expend</th>
<th>Aid/Investment</th>
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</thead>
<tbody>
<tr>
<td>1971-74</td>
<td>2.79</td>
<td>14.81</td>
<td>12.38</td>
<td>21.36</td>
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<tr>
<td>1990-94</td>
<td>3.76</td>
<td>24.46</td>
<td>33.40</td>
<td>40.18</td>
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<td>1995-99</td>
<td>8.79</td>
<td>51.80</td>
<td>62.74</td>
<td>54.06</td>
</tr>
<tr>
<td>2000</td>
<td>9.37</td>
<td>46.82</td>
<td>73.78</td>
<td>52.03</td>
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<td>2001</td>
<td>13.37</td>
<td>67.10</td>
<td>90.81</td>
<td>76.86</td>
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<td>2002</td>
<td>9.15</td>
<td>41.70</td>
<td>79.46</td>
<td>84.68</td>
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<td>2003</td>
<td>10.52</td>
<td>35.70</td>
<td>57.47</td>
<td>70.38</td>
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<td>2004</td>
<td>10.56</td>
<td>34.93</td>
<td>60.50</td>
<td>86.42</td>
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<tr>
<td>2005</td>
<td>10.57</td>
<td>38.73</td>
<td>48.66</td>
<td>58.94</td>
</tr>
<tr>
<td>2006</td>
<td>10.30</td>
<td>33.73</td>
<td>44.80</td>
<td>55.70</td>
</tr>
</tbody>
</table>


Example 4: Ethiopia.

Large fluctuations in aid (in % of GDP) and REER in recent years.

Illustrates need to control for a variety of factors affecting the REER (terms-of-trade shocks, etc.) in empirical models.

Evidence based on static models: cannot capture supply-side effect of aid-financed public investment and learning-by-doing effects.

Simulation models: more reliable (Session 4).
Ethiopia: Composition of Aid in Percent of GDP

<table>
<thead>
<tr>
<th>Year</th>
<th>ODA (OA) Total Net (all donors)</th>
<th>ODA (OA) Grants, Total (all donors)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1965</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>1967</td>
<td>5%</td>
<td>5%</td>
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<tr>
<td>1969</td>
<td>10%</td>
<td>10%</td>
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<tr>
<td>1971</td>
<td>15%</td>
<td>15%</td>
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<tr>
<td>1973</td>
<td>20%</td>
<td>20%</td>
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<tr>
<td>1975</td>
<td>25%</td>
<td>25%</td>
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<tr>
<td>1977</td>
<td>0%</td>
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<tr>
<td>1979</td>
<td>5%</td>
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<td>1981</td>
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<td>1983</td>
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<tr>
<td>2005</td>
<td>10%</td>
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<tr>
<td>2007</td>
<td>15%</td>
<td>15%</td>
</tr>
<tr>
<td>2009</td>
<td>20%</td>
<td>20%</td>
</tr>
<tr>
<td>2011</td>
<td>25%</td>
<td>25%</td>
</tr>
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</table>

Source: OECD and government authorities.

Ethiopia: Exchange Rates

<table>
<thead>
<tr>
<th>Year</th>
<th>Real (average)</th>
<th>Nominal (average)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989/90</td>
<td>-1.1%</td>
<td>1.6%</td>
</tr>
<tr>
<td>1990/91</td>
<td>0.2%</td>
<td>2.5%</td>
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<tr>
<td>1991/92</td>
<td>1.4%</td>
<td>4.7%</td>
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<td>1992/93</td>
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<td>3.1%</td>
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<td>1993/94</td>
<td>1.3%</td>
<td>4.8%</td>
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<td>1995/96</td>
<td>1.2%</td>
<td>4.2%</td>
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<td>1996/97</td>
<td>0.4%</td>
<td>2.6%</td>
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<td>1997/98</td>
<td>0.4%</td>
<td>2.5%</td>
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<td>1998/99</td>
<td>0.3%</td>
<td>2.4%</td>
</tr>
<tr>
<td>1999/00</td>
<td>0.2%</td>
<td>2.2%</td>
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<td>2000/01</td>
<td>0.1%</td>
<td>2.1%</td>
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<td>2001/02</td>
<td>0.0%</td>
<td>2.0%</td>
</tr>
<tr>
<td>2002/03</td>
<td>-0.1%</td>
<td>1.9%</td>
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Note: A rise in the real exchange rate is an appreciation.

Ethiopia: Index of Real Effective Exchange Rate

<table>
<thead>
<tr>
<th>Year</th>
<th>Value</th>
</tr>
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<tbody>
<tr>
<td>1989</td>
<td>75.0</td>
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<tr>
<td>1990</td>
<td>125.0</td>
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<tr>
<td>1991</td>
<td>175.0</td>
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<td>1992</td>
<td>225.0</td>
</tr>
<tr>
<td>1993</td>
<td>275.0</td>
</tr>
</tbody>
</table>

Source: IMF and World Bank.
Note: A rise in the real exchange rate is an appreciation.
Effectiveness of Sterilization

- Some countries have been able to intervene in the foreign exchange market to limit the exchange rate impact of aid inflows (by buying foreign exchange)…

- …while at the same time sterilizing the monetary impact of the intervention (by selling government paper).

- Sterilized intervention can be an effective way of preventing real appreciation in countries with a relatively closed capital account…

- …but it can be expensive because domestic interest rates are generally higher than rates of return on foreign assets.

Aid and Growth

- Early study on sub-Saharan Africa: Hadjimichael et al. (1995). Evidence of non-linearity; beyond a threshold of 25% of GDP, aid becomes detrimental to growth.

- More recent literature: controversial results (see Appendix II).

- Idea that aid is effective in enhancing growth only in countries with “good” policies: not robust.
Key problems of this literature:

- Reduced-form regressions: do not explain the transmission mechanism(s) from aid to growth (see Session 4).
- Not enough emphasis on the nonlinearities discussed earlier.
- Structural simulation models allows a better treatment of both issues.

Appendix I
Mechanics of Sterilization of Aid Inflows

- Case of a country with a managed float and an (explicit or implicit) inflation target.
- When government receives aid: it sells it to the Central Bank (CB).
- The CB’s net foreign assets, NFA, increases by the amount of aid, and its net domestic assets, NDA (essentially claims on the Government and commercial banks), fall by the same amount.
- Because $\Delta NFA = - \Delta NDA$, the net effect on the monetary base (CB’s liabilities) is zero.
• As government raises spending in response to the aid inflow, it draws down its balance at the CB. NDA increases, and so does the money supply.

• The CB can sterilize this expansion by

  • Selling off foreign exchange to the private sector in exchange for domestic currency. NFA falls…

  • …This shrinks the money supply and by increasing the supply of foreign currency on the market, leads to a real appreciation.

• Open-market operations—CB can sell debt to the private sector (banks) for domestic currency…

  • …This reduces NDA of the CB, offsetting the positive initial effect on NDA.

  • By swapping debt for money, price of these assets drops, and interest rates will increase (assuming imperfect capital mobility).

• Problem with first response: the implied volatility in the nominal exchange rate may not be desirable, because of its impact on inflation…

  • …although it could be desirable also, if inflation is running above target; potential conflict (trade-off) between domestic and external targets.

  • The nominal appreciation could also put downward pressure on the price of nontradables (e.g. with imported inputs and mark-up pricing); this would mitigate the real appreciation.
- Problem with second response: the high cost of holding foreign exchange reserves.

- Depends on the spread, that is, the difference between interest rate paid on the country’s public debt and interest earned on reserves (usually much lower).

- Cost of sterilization: depends positively on the amount of reserve accumulation and the interest spread…

- …and negatively on the expected depreciation of the domestic currency.

- For instance, if reserve accumulation is 10% of GDP, and the spread is 10%, the cost is 1% of GDP if expected depreciation is zero, and 0.5% if the expected depreciation is 5%.

- In practice: monetary response to large aid flows entails a combination of intervention in both foreign exchange and domestic debt markets.

- When aid flows are lumpy and/or temporary: letting the nominal exchange rate appreciate fully (without any change in CB’s reserves) may lead to excessive volatility…

- …Greater burden should be on sterilization, conducted across both the foreign exchange and domestic debt markets.

- In general: balance between the 2 instruments should depend on limiting exchange rate and interest rate volatility, and deviations of inflation from target.
Appendix II
Aid and Growth: A More Detailed Look at the Recent Evidence

* Burnside and Dollar (B-D, 2000): aid is effective in enhancing growth of GDP per capita only in countries with good fiscal, monetary, and trade policies.

* Cross-country regressions for 56 developing countries over 1970-93, they found that aid has no impact on the rate of economic growth in countries with poor macroeconomic policies.

* Update of their initial study, based now on data for the 1990s: B-D (2004).

* They argue that the evidence continues to corroborate their main conclusion—that the positive effect of aid on growth is conditional on having "good" institutions.

* However, a number of studies have questioned the robustness of the dependence of the aid-growth link on the policy regime.
1. Chauvet and Guillaumont (2003): although the marginal effect of aid on growth appears to depend on policies, as suggested by B-D,…

…policies themselves depend on aid, whereas aid effectiveness depends also on the degree of **economic vulnerability** (measured as a function of long-term changes in the terms of trade and export instability) and **domestic political instability**.

- Economic vulnerability: measured as a function of long-term changes in the terms of trade and export instability.

2. Dalgaard and Hansen (2001): found that the B-D results are very fragile.

- 5 observations, excluded in B-D’s original “preferred” regressions, have a critical influence on the parameter of interest.

- Aid spurs growth **unconditionally** (regardless of whether policies are "good" or "bad") but with decreasing marginal returns--perhaps as a result of gradually binding constraints on absorptive capacity (discussed earlier).

3. Easterly, Levine, and Roodman (2003): with a specification similar to B-D but with an extended sample, interaction term between aid and policies is also insignificant.

4. Easterly (2003) and Roodman (2003): even in same sample as B-D, result is not robust to alternative (and equally plausible) definitions of aid, policies, and long-run growth.

When physical investment and human capital are controlled for, aid has no direct effect on growth; only indirect, through its impact on capital formation.