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The Vietnamese Socio-economic Development Plan Revisited: Application of the 2003 Merged Model for Vietnam

Jensen, Henning Tarp and Tarp, Finn

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The Vietnamese Socio-economic Development Plan Revisited: Application of the 2003 Merged Model for Vietnam[1]

By

Henning Tarp Jensen
Department of Economics
University of Copenhagen

Finn Tarp
Department of Economics
University of Copenhagen

Abstract: This paper investigates the Vietnamese Socio-economic Development Plan (2006-10) using the 2003 Merged Model for Vietnam, which was developed in Jensen & Tarp (2007). Initialization and calibration of the model is based on a financial 2003 SAM framework and an auxiliary 2002-2003 data set. Furthermore, an auxiliary 2004-2005 data base was used to run the model forward and target 2005 starting values for the 2006-2010 development plan projections. The paper sets out a so-called 'SEDP Base Scenario', which is based on constant calibrated Merged Model parameter values. The base scenario turns out to be internally inconsistent, as indicated by divergent behaviour among the four model-specific focal variables. Dynamic (time-dependent) adjustments to parameter values subsequently allows for the derivation of the 'SEDP Consistent Scenario'. This scenario is internally consistent, in the sense that the model-specific focal variables settle down around sensible growth paths. The necessary parameter adjustments provide an indication of the structural assumptions underlying the SEDP development plan. These assumptions include (i) a strong initial drop in capital factor productivity (increasing capital-output ratio), (ii) a strong continuous drop in government foreign borrowing relative to export earnings, and an accompanying need to increase the government's reliance on domestic capital markets, (iii) the continuation of a very high import elasticity with respect to GDP throughout the planning period, and (iv) the pursuit of a long run target for official foreign exchange reserves amounting to 9 weeks of imports.

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1. Introduction

The current paper aims to provide a critical review of the consistency of the economic targets, which were recently adopted by the Vietnamese National Assembly in June 2006 as part of the five-year Socio-economic Development Plan (SEDP) for 2006-10. The plan was accompanied by an SEDP report (MPI; 2006) which contained two parts. The first part included an assessment of the implementation of the previous five-year plan (2001-2005), while the second part included an outline of the new five-year plan (2006-2010). Accordingly, the new five-year development plan follows up on the previous five-year plan and thereby completes the outline of the Vietnamese socio-economic development strategy for 2001-2010.

The assessment of the initial five-year development plan points to a number of positive achievements. Many of the ambitious development targets have been met and even surpassed in some instances. The positive achievements include 7.5 percent average GDP growth (on target), 37.5 percent average investment share of GDP (38.9 percent in 2005; surpassing the target for that year), and 17.3 percent average export growth (exceeding the target). In addition, the balance between consumption and investment has been maintained so as to ensure the simultaneous goals of capital accumulation and poverty reduction. Accordingly, poverty was reduced from 17.5 percent to 7.0 percent during 2001-2005.

Nevertheless, the assessment of the initial five-year development plan also points to shortcomings and weaknesses. GDP growth has been below potential (despite being on target), and the quality of development has been poor in terms of human development (training of labourers) and environmental protection. Structural transformation has been uneven due to lagging service sector development, technological change has been slow, the development of market institutions has experienced difficulties, and there are remaining deficiencies in public management. Internally generated revenue (excl. trade taxes and crude oil revenues) remains low, the efficiency of government investment remains low as well, and there is a lack of policy coordination associated with international integration and structural transformation. Finally, bad debts remain high and private sector access to capital remains low.

The list of shortcomings and weaknesses associated with the previous five-year development plan (2001-2005) has implications for the development of the subsequent five-year development plan (2006-2010). The lack of progress in human development and environmental protection may indicate that the current growth process in unsustainable. In particular, the lack of skills upgrading may imply that a lack of complementary factors (skilled labour) may limit the efficiency of the fast growing physical capital stock. Moreover, the continued degradation of natural resources may imply that bottlenecks may start to arise in relation to critical production inputs such as clean water and energy supply.

This paper seeks to review the internal consistency of the new SEDP development plan 2006-2010, using the 2003 Vietnam Merged Model projection framework, developed by Jensen & Tarp (2007). The Merged Model framework for construction and assessment of macroeconomic projections is briefly reviewed in Section 2. This is followed – in Section 3 – by a discussion of the calibration of model parameters and the derivation of exogenous variable growth paths based on SEDP target levels. An "SEDP Base Scenario", which is based on constant parameter values, is presented and discussed in Section 4, while an "SEDP Consistent Scenario", which is based on underlying structural changes (in model parameters), is presented and discussed in Section 5. In particular, it is shown that there are several important implicit assumptions about structural change underlying the SEDP development plan. Conclusions are presented in Section 6.

2. The Merged Model framework

The Merged Model is an economic planning tool which can be used to construct and assess macroeconomic projections. Accordingly, it is a projection framework which is based on a complete set of macroeconomic accounting identities and budget constraints, and a minimal set of behavioural relationships. In particular, the Merged Model provides a consistent accounting framework which can be used to assess the internal consistency of the various growth targets from the 2006-2010 Vietnam Socio-Economic Development Plan (SEDP). For a general discussion of the methodology underlying the calibration and application of 2003 Vietnam Merged Model, please refer to Jensen & Tarp (2007).

The Merged Model is an aggregate projection framework, which distinguishes between two aggregate private and the public sectors. The model accounts for current transactions, capital transactions, and financial transactions by the private and public sectors. In addition, the model accounts for current and financial transactions by an aggregate foreign sector through the inclusion of the balance of payments. Finally, the model includes accounting identities to ensure real sector goods market balance and financial sector money market balance, as well as consistent price determination. The Merged Model was originally derived from an attempt to integrate the World Bank's Revised Minimum Standard Model (RMSM) and the IMF's Financial Programming (FP) approach into one macroeconomic framework (Brixen & Tarp, 1996; Jensen & Tarp, 2002; Jensen & Tarp, 2006). The aggregate nature of the Merged Model projection framework can be seen from the underlying SAM data base (see Appendix A).

Altogether, the Merged Model consists of 29 equations (see Appendix B). Roughly speaking, these equations include 13 goods market equations (including endogenous private current transactions and residual government current transactions), 3 government sector equations (including residual government domestic credit taking), 6 money market equations (including endogenous money demand and residual private domestic credit taking), and 4 balance of payments equations (including exogenous government foreign borrowing and residual private foreign borrowing). In addition, the model contains 3 interest payment equations.

Projections are evaluated on the basis of four focal variables: (i) real government consumption, (ii) government domestic credit, (iii) private domestic credit, and (iv) private foreign borrowing. Each of the focal variables is associated with a specific sector of the economy. The Merged Model solves recursively between sectors of the economy, as well as between time periods. Inconsistencies in projected growth paths of specific exogenous variables can therefore easily be traced and identified by focussing on the endogenous growth paths of the four focal variables. In particular, the consistency of the SEDP development plan will be evaluated on the basis of the implied growth paths for the four focal variables (see Sections 4 & 5).

An overview of model parameters is provided in Appendix C, while an overview of model variables is given in Appendix D. Model variables are grouped into endogenous and exogenous variables, and growth paths need to be imposed for all exogenous variables. The calibration of model parameters

and the derivation of exogenous variable growth paths from the SEDP development plan are outlined in the following section.

[Table 1, 2 and 3 about here]

3. Merged Model calibration and SEDP target growth paths

3.1 Merged Model Calibration

The Merged Model was calibrated on the basis of a 2003 SAM data framework (appendix A) and a set of 2003 economic levels (Table 1). However, the SEDP development plan covers the period 2006-10. It was therefore necessary to run the model forward to 2005, in order to provide a proper basis for the evaluation of the SEDP development plan. The targeting of historical 2005 values was achieved by imposing 2004-2005 economic levels (Table 1) and/or 2004-2005 growth rates (Table 2). The targeting of 2004-2005 values implied that model parameters were calibrated for each of the years 2003-2005 (Table 3).

The Merged Model contains six equations with model parameters (in addition to the three interest rate equations with exogenous interest rates). Four of these equations contain one parameter. These parameters could be readily calibrated based on base year information. The two remaining equations for investment demand and import demand (equations (5)-(6) in Table B.1 in Appendix B) contain respectively two and three parameters. It was therefore necessary to impose exogenous information to calibrate these relationships.

First, it was assumed (for the base year calibration period 2003-2005) that the *Parameter relating investment demand to real GDP* (k1) has a fixed value of 2.50. This parameter can be shown to be equal to the capital-output ratio, and the parameter value is in accordance with historical evidence (Jensen & Tarp; 2007). This information is sufficient to calibrate the investment demand relationship. Second, it was assumed (for the base year calibration period 2003-2005) that the *GDP elasticity of import demand* (m1) has a fixed value of 1.20, while the *Real exchange rate elasticity of import demand* (m2) has a fixed value of -1.00. These parameter values are also consistent with

historical evidence (Jensen & Tarp; 2007), and they provide sufficient information to calibrate the import demand relationship. The calibrated parameter values are presented in Table 3.

3.2 Merged Model Calibrated Parameters

The calibrated parameter values show some variation. As noted in Jensen and Tarp (2007), the parameter values (as well as endogenous and exogenous variables) should be considered to be endogenous from the modeller's point of view. It is therefore important to study the past development of the calibrated parameter values (in the same way that it is important to study past growth paths of endogenous and exogenous variables), to make appropriate judgements about potential future changes in parameter values.

The greatest degree of variation in parameter values occur for the *Ratio of reserve changes to import changes* (d). It jumps from around 0.13-0.14 during 2003-2004, to a level around 0.55 in 2005. The analysis of this parameter in Jensen and Tarp (2007) confirm that it is inherently unstable. It was therefore decided to impose an exogenous value on this parameter both in the SEDP Base Scenario (Section 4) and the SEDP Consistent Scenarios (Section 5). The parameter was set to 0.19 in the SEDP Base Scenario (Table 10) based on the assumption that the long run policy target for official foreign exchange reserve holdings amounts to 10 weeks of imports. Subsequently, the parameter value was adjusted to 0.17 in the SEDP Consistent Scenario (Table 14) to ensure the internal consistency of the SEDP growth targets for the balance of payments (see below).

Otherwise, parameter values for the SEDP base scenario reflects 2005 calibrated values (Table 10), while the configuration of parameter growth paths for the SEDP Consistent Scenario (Table 14) reflect (i) sufficient parameter change to allow the SEDP growth paths to form a consistent economic scenario, and (ii) parameter change which is consistent (as far as possible) with historical parameter growth paths.

[Table 4 and 5 about here]

3.3 SEDP development plan targets

An overview of SEDP growth paths for exogenous Merged Model variables are provided in Table 4 (SEDP growth rates) and Table 5 (SEDP economic levels). The derivation of these growth paths from the growth targets of the SEDP development plan is reviewed in the following.

[Table 6 about here]

3.3.1 Real GDP and the GDP deflator

Table 6 presents the derivation of exogenous growth paths for real GDP and the GDP deflator. First, the SEDP development plan provides target intervals for nominal GDP growth over the planning period. This is translated into average target growth rates (average of target interval limits) for the nominal GDP growth path. The average growth rates imply that total accumulated nominal GDP over the planning period amounts to 6,600.5 Trillion VND. This lies within the stated SEDP target interval of 6,528-6,674 Trillion VND.

Second, the SEDP development plan provides a target interval of 7.5-8.0 percent for real GDP growth rates over the planning period. The average nominal GDP growth rates and the stated real GDP growth interval are consistent with a constant GDP deflator growth rate of 7.2-7.3 percent. It was decided to impose a constant 7.3 percent GDP deflator growth rate over the planning period. The SEDP target growth path for real GDP was subsequently derived from the growth paths for nominal GDP and the GDP deflator.

[Table 7 about here]

3.3.2 Real exports, export prices, import prices and the exchange rate

Table 7 presents the derivation of the exogenous growth paths for real exports, export prices, and the nominal exchange rate. First, the SEDP growth plan does not provide any information on the growth path of real exports over the planning period. However, it does provide an average target for the real export growth rate of 16.0 percent per year. In addition, the SEDP development plan

provides explicit targets for the nominal export growth path over the planning period. The nominal growth targets range between 15.5-18.4 percent per year (but below 16.8 percent for each year except 2010). Accordingly, the consistency of real and nominal export growth targets requires annual price changes amounting to around 0.5-1.0 percent.

The difference between real and nominal export growth targets must be accounted for by changes in world market export prices and the exchange rate. The average growth rate for (USD) export prices during 2003-2005 was -0.2 percent, while the average depreciation rate of the (USD/VND) exchange rate during 2003-2005 was 0.9 percent. Domestic currency price changes relating to real exports therefore amounted to 0.7 percent on average during 2003-2005. This level of price change lies within the consistent target range for price change over the planning period. It was therefore assumed that world market export prices and the exchange rate continue to change, in a smooth fashion (at constant growth rates), at the 2003-2005 average growth rate levels. This implies that both the nominal SEDP growth rate targets and the average real SEDP growth rate target for exports are satisfied by the current projections (Table 4).[2]

Nevertheless, Table 4 shows that the 2006 real export growth rate (10.2 percent) differ markedly from the average real SEDP target (16.0 percent). The difference arose since the preliminary 2005 nominal export number (559.3 Trillion VND) from the SEDP development plan (MPI; 2006) differs from the final 2005 nominal export number (582.7 Trillion VND) from the Government Statistical Office (GSO; 2006). In order to target the 2006 nominal export level from the development plan, it was decided to lower the 2006 nominal export growth rate below the target growth rate from the development plan. The target growth path for real exports was subsequently derived from the growth paths of for nominal exports, export prices, and the exchange rate.

Finally, the SEDP development plan provides no information regarding the future growth path for the (USD-denominated) import price index. The average growth rate for world market import prices

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[2] An annual 0.9 percent depreciation rate of the exchange rate is consistent with the SEDP growth targets for exports. However, it should be noted that it is not consistent with the various growth targets for FDI inflows. The SEDP development plan sets out targets for accumulated FDI inflows during 2006-2010 of (i) 19.5 Bio. USD, and (ii) 377 Bio. VND (2005 prices). Assuming that USD-denominated FDI inflows grows smoothly (implying a constant 35.1 percent annual growth rate; see below), and that the GDP deflator grows by 7.3 percent per year (see above), these different targets requires an annual rate of depreciation of 13.2 percent to be consistent.

during 2003-2005 (1.5 percent) was therefore imposed over the planning period (see Table 4). This implies a gradual deterioration of the international terms-of-trade (1.7 percent per year).

[Table 8 about here]

3.3.3 Government foreign and domestic revenue

Table 8 presents the exogenous growth paths for government revenue from domestic and foreign sources. Explicit target levels for government net foreign transfers and remaining (domestic) government income (including revenues from crude oil sales and trade tax receipts) were available from the SEDP development plan. This implies that total accumulated government revenue over the planning period amounts to 1,472.5 Trillion VND. This is (virtually) identical to the stated SEDP target for accumulated government revenue of 1,472.0 Trillion VND (MPI; 2006).

[Table 9 about here]

3.3.4 Government transfers, government investment, and government domestic debt

Table 9 presents the exogenous growth paths for nominal government transfers and real government investment. First, the SEDP development plan provides nominal target levels for government current expenditure, and nominal target intervals for government consumption over the planning period. Accordingly, nominal SEDP target intervals for government transfers were derived by subtracting government consumption target intervals from current expenditure target levels.

However, SEDP target levels for government current expenditure underestimates total government current expenditures, since the numbers exclude government transfers in relation to off-budget items. The SEDP target levels were therefore inconsistent with base period levels for government transfers. Government off-budget items accounted for 39 Trillion VND in 2005. In order to make target projection levels consistent with base period levels, it was assumed that transfers in relation to off-budget items remain unchanged at the 2005 level over the projection period 2006-2010.

The growth path for government transfers was derived as follows: The SEDP target intervals for government transfers (excl. off-budget items) were translated into average target levels (simple average of target interval limits) for government transfers (excl. off-budget items). Subsequently, the target growth path for government transfers (incl. off-budget items) was derived as the sum of the average target levels (excl. off-budget items) and the fixed amount of transfers due to off-budget items.

Second, the SEDP development plan provides nominal target levels for government investment expenditures. However, the SEDP development plan does not provide information on target growth paths for real government investment. Instead, the target growth path for real government investment was derived by applying the GDP deflator growth path (derived above) to correct the nominal target growth rates for future price changes.

Finally, no information is given about future changes in government net domestic debt in the SEDP development plan. Government net domestic debt was therefore assumed to grow according to the government consumption growth path (see Table 4). This assumption is further discussed (and corrected) in relation to the SEDP Consistent Scenario in Section 5.

3.3.5 Foreign Net Factor Payments, Private Net Foreign Transfers, and Foreign Direct Investment

The SEDP development plan does not provide information about future growth paths for foreign net factor payments or private net foreign transfers. Foreign net factor payments grew by an average 21.9 percent during 2003-2005, while private net foreign transfers grew by an average 22.5 percent during 2003-2005. Accordingly, the target growth paths for foreign net factor payments and private net foreign transfers were derived by applying constant growth rates of 21.9 percent and 22.5 percent to the respective 2005 levels of foreign net factor payments and private net foreign transfers.

Second, the SEDP development plan does not provide explicit information about the future growth path for foreign direct investment. However, it does provide target information for accumulated FDI inflows amounting to 19.5 Billion USD over the planning period 2006-2010. The average target FDI inflow (3.9 Billion USD per year) is relatively high compared to the inflow in 2005 which

amounted to 1.45 Billion USD (Table 1). Assuming a smooth growth path (constant annual growth rate) over the planning period, this implies that FDI inflows are assumed to grow by 35.1 percent per year over the planning period. Accordingly, the target growth path for foreign direct investment was derived by assuming that FDI inflows grow by 35.1 percent per year over the planning period (Table 4).[3]

3.3.6 Government domestic interest rate, and government and private foreign interest rates

The SEDP development plan does not provide information about the future growth path for interest rates. The effective government domestic interest rate was 1.4 percent on average during 2003-2005, the effective government foreign interest rate was 2.4 percent on average during 2003-2005, and the effective private foreign interest rate was 5.3 percent on average during 2003-2005. Accordingly, the target growth paths for interest rates were derived by assuming that interest rates remained constant at the average 2003-2005 values over the planning period 2006-2010.

[Tables 10 & 11 about here]

4. The SEDP Base Scenario

The SEDP Base Scenario was derived by (i) imposing SEDP target growth paths for exogenous model variables (see Section 3), and (ii) imposing the 2005 calibrated parameter values throughout the planning period (see Section 3).[4] Table 10 presents the SEDP Base Scenario parameter values. The assumption of constant parameters throughout the planning period is a strong assumption. Nevertheless, the current analysis serves to make the point that the SEDP development plan is based on assumptions about structural changes (in parameter values). The investigation of the parameter assumptions underlying the SEDP development plan is the subject of the Section 5.

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[3] The SEDP development plan sets out two targets for accumulated FDI inflows during 2006-2010, including (i) 19.5 Bio. USD, and (ii) 377 Bio. VND (2005 prices). The current projections use the former growth target. As discussed in footnote 1, the two FDI targets are consistent with a 7.3 percent GDP deflator growth rate and 13.2 percent depreciation rate of the exchange rate. Nevertheless, the current projections assume a rate of depreciation of 0.9 percent. This is consistent with the SEDP export growth targets, and a -0.2 percent export price growth rate. Adjusting the exchange rate growth rate to 13.2 percent would necessitate a lowering of the annual export price growth rate to -12.6 percent. This was deemed inappropriate.
[4] The only exception to the rule of constant parameter values was the "ratio of reserve changes to import changes". This parameter was set to the constant value 0.19, based on the assumption that the government's long run target is to maintain official foreign exchange reserves amounting to 10 weeks of imports. (See also Section 3.2)

As explained above, the Merged Model contains four focal variables which are used to (i) evaluate the internal consistency of a given set of projections, and (ii) diagnose inconsistent growth paths. Table 11 presents the implied growth paths for the four focal variables in the SEDP Base Scenario.

The following implications may be derived:

1. The growth path for real government consumption is inappropriate with high consumption levels during 2006-2009 followed by a sharp drop in 2010.

2. The implied government financing requirements raises the level of government domestic credit to inappropriate levels over the projection period. Government domestic credit should always hover within a limited interval above zero according to best practise methods to avoid adverse effects on monetary policy and price formation and private sector credit availability.

3. The expansion of private sector domestic credit over the planning period is not unreasonable (in spite of the inappropriate government domestic credit expansion)

4. The rapid decline (and negative values) for the private net foreign debt stock is inappropriate. It is inconceivable that the private sector should reduce their foreign debt (and subsequently expand their net foreign assets) at the implied rates of change.

The underlying explanation for the rapid drop in the private foreign debt stock (the fourth implication) is related to the constant parameter assumption. The government foreign debt expands in parallel with the strong expansion of export earnings, since the ratio between government net foreign debt and export earnings is assumed to remain constant over the planning period. Since foreign lending is the residual financing source in the (capital account of) the Balance of Payments (BoP), the rapid expansion of government foreign borrowing must lead to a similar drop in private foreign borrowing to ensure BoP equilibrium. It follows that the SEDP development plan is not consistent with a constant government foreign debt-to-exports ratio. Instead, the SEDP plan implicitly assumes that this ratio is going to decline over time.

The underlying explanation for the inappropriate government domestic credit growth path (the second implication) is partly due to the implied changes in government consumption. Nevertheless,

it is mainly due to the development of other government financing sources. The SEDP development plan does not contain information about government domestic borrowing. Accordingly, it was assumed (see above) that the domestic debt grows by 22.5 percent per year in line with nominal government consumption (Table 4). The government domestic debt amounted to 84 Trillion VND in 2005. The relatively high initial level combined with the relatively high growth rates would under normal circumstances imply that there would be downward pressure on other (residual) financing sources. This is, however, not the case in the current base scenario. Instead, there is upward pressure on government domestic credit. The SEDP development plan therefore implicitly assumes that the domestic debt expands at a faster pace than nominal government consumption.

In fact, the government domestic debt stock must expand at a much faster pace than nominal government consumption. The current expansion of the government foreign debt stock is not consistent with BoP equilibrium as discussed above. The need for reduced government foreign borrowing puts additional pressure on the need to expand domestic borrowing. It follows that the SEDP development plan implicitly assumes that the domestic debt expands at a significantly faster pace than nominal government consumption.

The explanation for the inappropriate government consumption growth path (the first implication) is also related to the constant parameter assumption. First, total absorption is determined from exogenous GDP and export growth paths, and from an import demand specification (based on constant parameters). Second, total consumption is determined as the residual between available resources (total absorption) and investment demand, which is determined from an investment needs specification (based on constant parameters). Finally, private consumption is determined from applying a (constant) average consumption propensity to private disposable income, while government consumption is residually determined. It follows that the government consumption growth path is influenced by (i) the SEDP target growth paths for GDP and exports, and (ii) the constant parameter assumptions regarding the investment demand, import demand, and private consumption specifications.

[Table 12 about here]

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Apart from using the focal variables, we may also evaluate the SEDP Base Scenario by comparing implied (endogenous) growth paths with SEDP target levels. Table 12 presents implied growth paths and SEDP targets for the resource balance. Nominal GDP and nominal exports are targeted to SEDP growth paths – as they should be – given the targeting of real aggregate growth rates and price levels. In relation to the government consumption growth path, numbers indicate that projections are relatively high compared to SEDP targets. In particular, government consumption overshoots SEDP targets by around 50 percent during 2008-2009, and around 20 percent during 2010.

As indicated above, the reason for the strong overshooting of government consumption must be found among implied growth paths for other macroeconomic aggregates. The projections of import demand resemble SEDP targets fairly well. Differences vary between 1.0 percent (2006-2009) and 1.5 percent (2010). It follows that projections of total available resources (total absorption) also resemble SEDP targets fairly well. In contrast, the projections of investment demand differ quite markedly from the SEDP target growth path with shortfalls ranging between -9 percent (2006) to -11 percent (2008-2009). Moreover, the investment shortfalls spill over into the (residual) determination of total consumption, where overshooting ranges between 4-5 percent (2006-2010). One of the main reasons for the strong overshooting of government consumption can therefore be traced to the projections of investment demand.

This analysis may be taken a step further. The parameters of the investment needs specification may be shown to be increasing functions of the capital-output ratio and the capital depreciation rate (Jensen & Tarp; 2007). It follows that the SEDP development plan implicitly assumes that the capital-output ratio and/or the capital depreciation rate parameters are increasing over time. This conclusion is reinforced by the fact that projections of private consumption (the final resource balance item which affects the determination of government consumption) resemble SEDP targets fairly well. Differences range between 1-2 percent (2006-2010).

[Table 13 about here]

We may further evaluate the SEDP Base Scenario by comparing projections of foreign borrowing aggregates to SEDP target growth paths. Table 13 presents accumulated growth paths and SEDP

accumulated targets for foreign loan disbursements over the planning period 2006-2010. As noted above, the inappropriate projected drop in private foreign borrowing stems from the rapid expansion of government foreign borrowing and the need to ensure BoP equilibrium. Accordingly, the projection of accumulated government net foreign loan disbursements net of interest payments (11,630 Mio. USD) significantly overshoot the SEDP target (3,000 Mio. USD), while the projection of accumulated private net loan disbursements net of interest payments (-11,713 Mio. USD) significantly undershoot the SEDP target (400 Mio. USD). Clearly, the strong expansion of government foreign borrowing (in line with export earnings) is the main reason for the strong differences between projections and SEDP targets of private foreign loan disbursements.

However, the numbers in Table 13 also indicate that the projections of the capital account surplus are likely to be inconsistent. Unfortunately, there are no SEDP targets for foreign interest payments. It is therefore not possible to be accurate on this issue. Nevertheless, the projections for the total (private and government) accumulated net foreign loan disbursements net of interest payments (-83 Mio. USD) is very low compared with the accumulated SEDP target (3,400 Mio. USD). The difference can partly be explained by the relatively low projections of imports (Table 12), which increases the current account surplus and lowers the need for foreign capital inflows. Nevertheless, the numbers also indicate that the projections of foreign exchange reserve accumulation are excessive. It follows that the SEDP development plan implicitly operates with a long run target for official foreign exchange reserves, which amounts to less than 10 weeks of imports – the assumption underlying the choice of parameter value in the current SEDP Base scenario (see Section 3.2).

In sum, the above analysis suggests that the SEDP development plan is based on a number of underlying assumptions regarding structural changes in fundamental model parameters. In particular, government foreign borrowing is implicitly assumed to grow less rapidly than exports, i.e. the "government foreign debt-to-exports ratio" is assumed to decline over time. Second, SEDP target investment demand is growing more rapidly than implied by constant parameters, i.e. the underlying "capital-output ratio" and/or "capital depreciation rate" parameters are implicitly assumed to increase over time. Third, the SEDP target for foreign loan disbursement exceeds foreign loan disbursements implied by a constant foreign exchange reserve accumulation parameter, i.e. the long run target for official foreign exchange reserves need to be reduced.

Finally, the constant private savings propensity (one minus the average propensity to consume) provides projections of private consumption which are fairly close to SEDP target levels. The constant money velocity (which affects domestic credit availability) cannot be evaluated against SEDP targets, but this assumption does not seem to give rise to any major discrepancies between projections and SEDP targets. Overall, it may be concluded that the SEDP development plan (MPI; 2006) rely on underlying structural assumptions which are not explicitly stated. These assumptions are further explored in Section 5.

[Tables 14, 15, 16, 17 & 18 about here]

5. The SEDP Consistent Scenarios

The SEDP consistent scenario which is outlined in this section was developed on the basis of the analysis from the previous section. In particular, parameter values for five parameters and growth rates for exogenous government domestic borrowing are adjusted to target SEDP development growth paths for (i) the four focal variables, and (ii) endogenous national accounts aggregates from the resource balance. Table 14 presents the SEDP Consistent Scenario growth paths for model parameters, while Table 15 presents the SEDP Consistent Scenario growth paths for exogenous variables and Table 16 the focal variables of the SEDP consistent scenario.

The derivation of the adjusted parameter values and exogenous variable growth rates takes advantage of the (within and between time period) recursive nature of the Merged Model (Jensen & Tarp; 2007). First, the "GDP elasticity of import demand" was adjusted to target the SEDP growth path of import demand (Table 17). A comparison between SEDP Base Scenario parameters (Table 10) and SEDP Consistent Scenario parameters (Table 14) confirms the conclusion from the previous section, that little parameter adjustment was necessary to achieve consistency with the SEDP target growth path for imports. The SEDP development plan therefore relies on the underlying assumption that the import demand elasticity with respect to GDP remains around 1.2 through out the planning period 2006-2010.[5]

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[5] In the targeting of import demand, it was assumed that the constant and the real exchange rate elasticity of the import demand function retained their base scenario values.

Second, the "ratio of reserve changes to import changes" was adjusted to target the sum of the SEDP targets for private and government accumulated net foreign loan disbursements (3,400 Million USD) during the planning period 2006-2010 (Table 18). This was done by a uniform lowering of the base scenario parameter value (0.192) to the consistent scenario parameter value (0.173). This amounts to a de facto lowering of the government's implicit long run target for official foreign exchange reserve holdings, from 10 weeks of imports to 9 weeks of imports. Accordingly, the SEDP development plan is implicitly based on a long run target for foreign exchange reserves amounting to 9 weeks of import costs.

Third, the "ratio of government net foreign debt to exports" was adjusted to meet the SEDP target for government accumulated net foreign loan disbursements (3,000 Million USD), and thereby to meet the SEDP target for private accumulated net foreign loan disbursements (400 Million USD) over the planning period 2006-2010 (Table 18). This was achieved by lowering the constant base scenario parameter value (0.377) by an annual 0.024, implying that the consistent scenario parameter value declines over time to a level of 0.255 in 2010 (Table 14). It follows that the SEDP development plan target for government foreign loan disbursements is consistent with an annual 2.4 percentage point decline in the government foreign debt-to-export earnings ratio. In sum, the above structural parameter adjustments ensure consistency with the balance of payments targets in the SEDP development plan.

Fourth, the "parameter relating investment to growth in real GDP" was adjusted to target the SEDP growth path for nominal investment needs (Table 17). Accordingly, the constant base scenario parameter value (2.500) was increased (as discussed in the previous section) to a maximum of 3.179 in 2008, and subsequently reduced to 3.039 in 2010 (Table 14). This parameter has the interpretation of "capital-output ratio" as demonstrated in Jensen & Tarp (2007). It follows that the SEDP development plan relies on an underlying assumption that the productivity of capital will be rapidly declining, and that more capital accumulation is needed to maintain historical GDP growth rates.[6] This is a strong assumption, since the "capital-output ratio" seems to have remained fairly

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[6] In the targeting of investment needs, it was assumed that the "parameter relating investment to level in real GDP" retained its base scenario values. This parameter has the interpretation of being the product of the "capital-output ratio" and the "capital depreciation rate" as demonstrated in Jensen & Tarp (2007). In principle, changes in the underlying "capital-output ratio" should therefore also lead to changes in this parameter. Nevertheless, it was decided to leave the parameter unchanged, to keep the analysis clean. In this way, the resulting change in the "capital-output ratio" may have

constant around 2.50 over the latest years, as demonstrated in Jensen & Tarp (2007). Nevertheless, it may be consistent with the general point of view in the SEDP development plan, i.e. the past lack of human development may lead to future shortages in the supply of skilled labourers. Accordingly, the future lack of complementary skilled workers may lower the productivity of physical capital.

The targeting of the SEDP growth path for investment should also implicitly lead to the (residual) targeting of the SEDP growth path for aggregate consumption. Nevertheless, a small discrepancy remains between the current projections and the SEDP growth path as demonstrated in Table 17. This discrepancy arises since the SEDP target levels in Tables 12 & 17 are not internally consistent. Accordingly, they were derived from target intervals by simple averages of interval limits. Nevertheless, the discrepancy only amounts to a maximum 0.1 percent over the planning period (2006-2010).

Fifth, the "private saving propensity" was adjusted to target the SEDP growth path for private consumption (Table 17). This implicitly ensures the (residual) targeting of government consumption. Subsequently, the exogenous growth path for "Government Net Domestic Debt" was adjusted to target a constant level of "Government Domestic Credit" amounting to 10,000 Billion VND during the planning period 2006-2010. However, since the private sector receives government domestic interest payments, the adjustment of government domestic borrowing affects private disposable income and private consumption, and implicitly government consumption. It was therefore decided to adjust the "private saving propensity" one more time to target private and government consumption. This iterative procedure resulted in a growth path for "Government Domestic Credit" which is quite reasonable, rising over time from 10,000 Billion VND in 2006 to 13,984 Billion VND in 2010 (Table 16).

As noted above, the targeting of private consumption implicitly leads to the (residual) targeting of the SEDP growth path for government consumption, except for a small difference due to the above-mentioned inconsistency between SEDP target levels for national account aggregates. Nevertheless, the projections of nominal government consumption remain within 1 percent of SEDP target levels as demonstrated in Table 17.

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been overstated somewhat. However, the overstatement may be compensated for, to the extent that the "capital depreciation rate" declines over the planning period.

The adjustment to the "private saving propensity" to target the SEDP growth path for private consumption means that the constant base scenario parameter value (0.330) had to be increased (as discussed in the previous section) to a maximum level of 0.344 in 2010 (Table 14). This represents a 1.4 percentage point increase in the private savings propensity over a period of five years. Accordingly, the SEDP development plan is based on an implicit assumption that the private savings propensity will increase by 1.4 percentage points over the planning period (2006-2010).

In addition, the "targeting" of government domestic credit implied that growth rates for "Government Net Domestic Debt" had to be increased quite dramatically. Accordingly, the SEDP development plan is consistent with very high initial growth rates (maximum: 27.8 percent in 2007) and lower (but still high) subsequent growth rates (minimum: 11.3 percent in 2010) for government domestic debt (Table 15). The high growth rates correspond to an increase in government domestic debt from 10.2 percent of GDP in 2005 to 12.0 percent of GDP in 2007 and 12.6 percent in 2008-2009. Overall, the limited recourse to foreign borrowing (as set out in the SEDP development plan) and the limited use of government domestic credit taking (due to best practise methods in relation to monetary policy) means that the SEDP development plan relies quite heavily on domestic debt financing to cover the implicit government budget deficits over the planning period 2006-2010. Moreover, the implicit pressure is especially strong during the initial part of the planning period (2006-2007).

6. Conclusion

This paper has provided an analysis of the Socio-Economic Development Plan 2006-2010 for Vietnam. Using the Merged Model macroeconomic projection framework, it has been demonstrated that the development plan is based on several important structural assumptions. The capital-output ratio is assumed to increase quite dramatically from previous levels around 2.5 to levels above 3.0. In particular, the capital-output ratio is assumed to rise dramatically over the initial years of the planning period 2006-2007. This implies that the productivity capital is assumed to suffer a strong decline in a matter of a few years. It also implies that higher rates of capital accumulation are needed to maintain historical GDP growth rates. This implicit structural assumption of the SEDP development plan may be linked to another general conjecture in the development plan. The past lack of human development may lead to future shortages in complementary skilled labourers, and this may lower the productivity of physical capital.

While higher rates of capital accumulation are needed to substitute for declining productivity, additional foreign borrowing is strongly limited. The development plan implicitly assumes that the government foreign debt declines from around 37.7 percent of export earnings in 2005 to 25.5 percent of export earnings in 2010. Instead, the government must use domestic debt markets to finance their recurring budget deficits. In particular, the government domestic debt is projected to rise from 10.2 percent of GDP in 2005 to 12.0 percent of GDP in 2007 and 12.6 percent in 2008-2009. Clearly, this development plan will put pressure on domestic capital markets.

Overall, the SEDP development plan seems to rely on two inconsistent objectives, including (i) strong capital accumulation to substitute for declining capital productivity, and (ii) government reliance on domestic capital markets to reduce reliance on foreign capital markets. The current projections indicate that these objectives are mutually consistent (assuming that the private saving propensity increases by 1.4 percentage points over the planning period 2006-2010). Nevertheless, it seems that the simultaneous pursuit of these objectives is likely to lead to adjustment problems and strains on the domestic financial system.

It may also be noticed that the calibration of the Merged Model relied on a relatively high import demand elasticity with respect to GDP (1.20). This assumption was based on the historical analysis

in Jensen & Tarp (2007). The current analysis indicates that that the high elasticity is fairly consistent with the SEDP target growth path for import demand. Accordingly, the SEDP development plan is relying on an underlying assumption that the elasticity of import demand with respect to GDP will remain significantly above 1 over the planning period 2006-2010, and that import demand will continue to expand strongly as a share of GDP. Finally, the analysis of the balance of payment showed that the SEDP development plan relies on an implicit government long run target for official foreign exchange reserves amounting to 9 weeks of imports.

Appendix A: Tables

Table A.1. Real SAM (Labels)

	COM	PRV	STATE	GCAP	PCAP	DINT	FINT	ROW	TOTAL
COM		Private Consumption	Government Consumption	Government Investment	Private Investment			Exports (c.i.f.)	(1)
PRV	Value Added at Market Price		Government Transfers			Government Domestic Interest Payments		Private Net For. Transf. + Net Factor Payments	(2)
STATE		Government Domestic Revenue						Government Net Foreign Transfers	(3)
GCAP			Government Savings						(4)
PCAP		Private Savings		Government Borrowing Requirement				Current Account Deficit	(5)
DINT			Government Dom. Interest Payments						(6)
FINT		Private For. Interest Payments	Government For. Interest Payments						(7)
ROW	Imports (f.o.b.)						Total For. Interest Payments		(8)
TOTAL	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	

Table A.2. Financial SAM (Labels)

	DFIN	FFIN	FFDI	GFIN	PFIN	CAPGAIN	GCAP	PCAP	TOTAL
DFIN					Money Supply Accumulation				(1)
FFIN	Foreign Exchange Reserve Accumulation							Current Account Deficit	(2)
FFDI		Foreign Direct Investment Inflow							(3)
GFIN	Government Domestic Credit Accumulation	Government Net Foreign Debt Accumulation			Government Net Domestic Debt Accumulation		Government Savings		(4)
PFIN	Private Domestic Credit Accumulation	Private Net Foreign Debt Accumulation	Foreign Direct Investment Inflow			Revaluation Gains on Forex Reserves		Private Savings	(5)
CAPGAIN	Revaluation Gains on Forex Reserves								(6)
GCAP				Government Investment					(7)
PCAP					Private Investment		Government Borrowing Requirement		(8)
TOTAL	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	

Table A.3. Real 2003 Vietnam SAM (Mio. VND)

RSAM	COM	PRV	STATE	GCAP	PCAP	DINT	FINT	ROW	TOTAL
COM		406,451	38,770	57,900	162,877			366,445	1,032,443
PRV	613,443		89,430				3,114	23,532	729,519
STATE		150,000						3,000	153,000
GCAP			18,400						18,400
PCAP		171,863		-39,500				30,514	162,877
DINT		0	3,114						3,114
FINT		1,205	3,286						4,490
ROW	419,000						4,490		423,490
TOTAL	1,032,443	729,519	153,000	18,400	162,877	3,114	4,490	423,490	

Source: GSO (2006) & IMF (2006).
Account Labels: COM – Commodities; PRV – Private Current; STATE – Government Current; GCAP – Government Capital; PCAP – Private Capital; DINT – Domestic Interest Payments; FINT – Foreign Interest Payments; ROW – Rest of the World

Table A.4. Financial 2003 Vietnam SAM (Mio. VND)

FSAM	DFIN	FFIN	FDI	GFIN	PFIN	CAPGAIN	GCAP	PCAP	TOTAL
DFIN					82,100				82,100
FFIN	12,148							30,514	42,662
FDI		20,402							20,402
GFIN	11,300	13,900			14,300		18,400		57,900
PFIN	56,800	8,359	20,402			1,852		171,863	259,277
CAPGAIN	1,852								1,852
GCAP				57,900				-39,500	18,400
PCAP					162,877				162,877
TOTAL	82,100	42,662	20,402	57,900	259,277	1,852	18,400	162,877	

Source: GSO (2006) & IMF (2006).
Account Labels: DFIN – Domestic Financial System; FFIN – Foreign Financial System; PFIN – Private Financial; GFIN – Government Financial; CAPGAIN – ForEx Capital Gains; GCAP - Government Capital ; PCAP – Private Capital

Appendix B:

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Table B.1. The 2003 Vietnam Merged Model

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Goods Market

$GDPS_{s,t}$	=	$(1+\gamma_{s,t})*GDPS_{s,t-1}$	(1)
GDP_t	=	$\Sigma_s\,GDP_{s,t}$	(2)
$XS_{s,t}$	=	$(1+\lambda_{s,,t})*XS_{s,t-1}$	(3)
X_t	=	$\Sigma_s\,XS_{s,t}$	(4)
IV_t	=	$k_{0,t}GDP_{t-1}+k_{1,t}\Delta GDP_t$	(5)
$\log(M_t)$	=	$m_{0,t}+m_{1,t}\log(GDP_t)+m_{2,t}\log(E_t*MPI_t/PD_t)$	(6)
C_t	=	CP_t+CG_t	(7)
IV_t	=	IVP_t+IVG_t	(8)
PD_t*CP_t	=	$(1-b_t)*GDY_t$	(9)
PD_t*GDP_t	=	$P_t*(C_t+IV_t) + E_t*(XPI_t*X_t-MPI_t*M_t))$	(10)
$PD_{2003}*GDP_t$	=	$P_{2003}*(C_t+IV_t) + E_{2003}*(XPI_{2003}*X_t-MPI_{12003}*M_t))$	(11)
GDY_t	=	$PD_t*GDP_t+E_t*NFP_t+E_t*NTRP_t+INDG_t+(GT_t-TG_t)-E_t*INFP_t$	(12)
GDS_t	=	$PD_t*GDP_t+E_t*(NFP_t-INFG_t-INFP_t)+E_t*(NTRP_t+NTRG_t)-P_t*C_t$	(13)

Government Budget

BRG_t	=	$P_t*(CG_t+IVG_t)+(GT_t-TG_t)+ INDG_t +E_t*(INFG_t-NTRG_t)$	(14)
BRG_t	=	$E_t*\Delta NFDG_t+ \Delta NDDG_t+\Delta DCG_t$	(15)
$NFDG_t$	=	$g_t*XPI_t*X_t$	(16)

Money Market

$GDPN_t$	=	PD_t*GDP_t	(17)
MD_t	=	$(1/v_t)*GDPN_t$	(18)
ΔMS_t	=	$\Delta(E_t*R_t)+\Delta DC_t$	(19)
ΔR_t	=	$d_t(MPI_t*M_t-MPI_{t-1}*M_{t-1})$	(20)
DC_t	=	DCG_t+DCP_t	(21)
MS_t	=	MD_t	(22)

Balance of Payments

$RESBAL_t$	=	$(XPI_t*X_t-MPI_t*M_t)$	(23)
$NETFSY_t$	=	$NFP_t-INFG_t-INFP_t$	(24)
$CURBAL_t$	=	$RESBAL_t+NETFSY_t+NTRG_t+NTRP_t$	(25)
ΔR_t	=	$CURBAL_t +\Delta NFDG_t+\Delta NFDP_t+FDI_t$	(26)

Interest Payments

$INDG_t$	=	$irdg_t* NDDG_{t-1}$	(27)
$INFG_t$	=	$irfg_t*NFDG_{t-1}$	(28)
$INFP_t$	=	$irfp_t*NFDP_{t-1}$	(29)

Appendix C:

Table C.1. Merged model parameters

Sectoral GDP	
γ_s	Sectoral GDP growth rates
Sectoral Exports	
λ_s	Sectoral export growth rates
Investment Demand	
k_0	Investment demand parameter with respect to lagged GDP
k_1	Investment demand parameter with respect to GDP growth
Import Demand	
m_0	Import demand level parameter
m_1	Import demand elasticity with respect to GDP
m_2	Import demand elasticity with respect to relative import prices
Private Consumption	
b	Average savings propensity
Interest Rates	
irdg	Government domestic interest rate
irfg	Government foreign interest rate
irfp	Private foreign interest rate
Government Foreign Debt	
g	Government net foreign debt-to-exports ratio
Money Demand	
v	Velocity of money circulation
Foreign Exchange Reserves	
d	incremental foreign exchange reserve-to-import growth ratio

Appendix D:

Table D.1. Merged Model Variables

Endogenous Variables		**Exogenous Variables**	
Flow variables			
BRG	Government borrowing requirement	FDI	Foreign direct investment inflows (USD)
C	Aggregate real consumption	GT	Government domestic revenues
CG	Government real consumption	IVG	Government real investment
CP	Private real consumption	NFP	Net factor payments (USD)
CURBAL	Current account balance (USD)	NTRG	Government net foreign transfers from abroad (USD)
GDP	Real GDP	NTRP	Private net foreign transfers from abroad (USD)
GDPN	Nominal GDP	TG	Government transfers to the private sector
GDPS	Real sectoral GDP		
GDS	Gross domestic savings		
GDY	Private sector disposable income		
INDG	Government net domestic interest payments		
INFG	Government net foreign interest payments (USD)		
INFP	Private net foreign interest payments (USD)		
IV	Aggregate real investment		
IVP	Private real investment		
M	Real imports		
NETFSY	Net Factor Service Income (USD)		
RESBAL	Resource balance (USD)		
X	Real exports		
XS	Real sectoral exports		
Stock variables			
DC	Total domestic credit taking	NDDG	Government net domestic debt
DCG	Government domestic credit taking		
DCP	Private domestic credit taking		
MD	Money demand		
MS	Money supply		
NFDG	Government net foreign debt (USD)		
NFDP	Private net foreign debt (USD)		
R	Foreign exchange reserve holdings (USD)		
Price variables			
P	Absorption deflator	E	Exchange rate (VND/USD)
		MPI	World market price deflator for imports (USD)
		PD	GDP deflator
		XPI	World market price deflator for exports (USD)

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Table 1. Exogenous Variables (Initial Levels)

	2003	2004	2005
Real Agriculture GDP (AGDP) [1]	129,217	134,854	140,306
Real Industry GDP (IGDP) [1]	236,077	260,198	287,906
Real Service GDP (SGDP) [1]	248,149	266,175	288,759
Real Agriculture Exports (AX) [1]	4,904	5,713	7,961
Real Industry Exports (IX) [1]	14,597	19,622	22,776
Real Service Exports (SX) [1]	3,920	4,533	5,004
Exchange Rate (E) [2]	15,646	15,777	15,914
Import Price Index (MPI) [3]	1	1.05	1.02
Export Price Index (XPI) [3]	1	1.02	1.02
GDP Deflator (PD) [3]	1	1.08	1.17
Government Transfers (GT) [1]	89,430	94,685	135,748
Government Domestic Revenues (TG) [1]	150,000	188,400	214,800
Real Government Investment IVG [1]	57,900	58,792	61,526
Government Net Domestic Debt (NDDG) [1]	64,034	76,134	85,534
Foreign Net Factor Payments (NFP) [4]	-525	-474	-780
Government Net Foreign Transfers (NTRG) [4]	192	184	145
Private Net Foreign Transfers (NTRP) [4]	2,100	2,310	3,150
Foreign Direct Investment (FDI) [4]	1,304	1,342	1,448
Government Domestic Interest Rate (IRDG) [5]	4.9%	2.7%	2.8%
Government Foreign Interest Rate (IRFG) [5]	1.9%	2.6%	2.1%
Private Foreign Interest Rate (IRFP) [5]	3.0%	3.1%	4.8%

Source: GSO (2006) & IMF (2006).
Footnotes: [1] Mio. VND [2] VND/USD [3] Index Value [4] Mio. USD [5] Percent

Table 2. Exogenous Variables (Initial Growth Rates)

	2004	2005
Agriculture GDP (AGDPgr) [1]	4.4%	4.0%
Industry GDP (IGDPgr) [1]	10.2%	10.6%
Service GDP (SGDPgr) [1]	7.3%	8.5%
Agriculture Exports (AXgr) [1]	16.5%	39.3%
Industry Exports (IXgr) [1]	34.4%	16.1%
Service Exports (SXgr) [1]	15.7%	10.4%
Exchange Rate (Egr) [1]	0.8%	0.9%
Import Price Index (MPIgr) [1]	5.1%	-2.5%
Export Price Index (XPIgr) [1]	1.6%	0.8%
GDP Deflator (PDgr) [1]	8.2%	8.0%
Government Transfers (GTgr) [1]	5.9%	43.4%
Government Domestic Revenues (TGgr) [1]	25.6%	14.0%
Government Real Investment (IVGgr) [1]	1.5%	4.7%
Government Net Doemstic Debt (NDDGgr) [1]	18.9%	12.3%
Foreign Net Factor Payments (NFPgr) [1]	-9.7%	64.6%
Government Net Foreign Transfers (NTRGgr) [1]	-4.1%	-21.4%
Private Net Foreign Transfers (NTRPgr) [1]	10.0%	36.4%
Foreign Direct Investment (FDIgr) [1]	2.9%	7.9%
Government Domestic Interest Rate (IRDGadd) [2]	-2.1%	-2.1%
Government Foreign Interest Rate (IRFGadd) [2]	0.7%	0.2%
Private Foreign Interest Rate (IRFPadd) [2]	0.1%	1.7%

Source: GSO (2006) & IMF (2006).

Footnotes: [1] year-on-year relative percentage change [2] Absolute percentage difference from base year values

Table 3. Model Parameters (Calibration)

		2003	2004	2005
b	Private savings propensity	0.30	0.28	0.33
d	Ratio of reserve changes to import changes	0.14	0.13	0.55
g	Ratio of government net foreign debt to exports	0.47	0.41	0.38
k0	parameter relating investment demand to real GDP level	0.20	0.20	0.19
k1	parameter relating investment demand to real GDP growth	2.50	2.50	2.50
m0	Constant in import demand function	-3.05	-2.98	-3.01
m1	GDP elasticity of import demand	1.20	1.20	1.20
m2	Real exchange rate elasticity of import	-1.00	-1.00	-1.00
v	money velocity	1.49	1.34	1.21

Source: Own calculations.
Note: Parameter values are exogenously imposed for k1, m1, and m2. Remaining parameters are calibrated from base year data

Table 4. Exogenous Variables (SEDP growth rates)

	2006	2007	2008	2009	2010
Agriculture GDP (AGDPgr) [1]	7.9%	7.6%	7.5%	7.7%	7.8%
Industry GDP (IGDPgr) [1]	7.9%	7.6%	7.5%	7.7%	7.8%
Service GDP (SGDPgr) [1]	7.9%	7.6%	7.5%	7.7%	7.8%
Agriculture Exports (AXgr) [1]	10.1%	16.0%	15.9%	15.8%	17.6%
Industry Exports (IXgr) [1]	10.1%	16.0%	15.9%	15.8%	17.6%
Service Exports (SXgr) [1]	10.1%	16.0%	15.9%	15.8%	17.6%
Exchange Rate (Egr) [2]	0.9%	0.9%	0.9%	0.9%	0.9%
Import Price Index (MPIgr) [1]	1.5%	1.5%	1.5%	1.5%	1.5%
Export Price Index (XPIgr) [1]	-0.2%	-0.2%	-0.2%	-0.2%	-0.2%
GDP Deflator (PDgr) [1]	7.3%	7.3%	7.3%	7.3%	7.3%
Government Transfers (GTgr) [3]	3.5%	1.3%	5.4%	6.5%	6.6%
Government Domestic Revenues (TGgr) [1]	7.5%	11.5%	12.0%	12.0%	11.5%
Government Real Investment (IVGgr) [1]	-0.2%	3.8%	5.0%	3.2%	3.9%
Government Net Domestic Debt (NDDGgr) [3]	20.9%	6.2%	9.4%	10.2%	9.8%
Foreign Net Factor Payments (NFPgr) [2]	21.9%	21.9%	21.9%	21.9%	21.9%
Government Net Foreign Transfers (NTRGgr) [1]	7.8%	-0.8%	-0.8%	-0.8%	-0.8%
Private Net Foreign Transfers (NTRPgr) [2]	22.5%	22.5%	22.5%	22.5%	22.5%
Foreign Direct Investment (FDIgr) [1]	35.1%	35.1%	35.1%	35.1%	35.1%
Government Domestic Interest Rate (IRDGadd) [4]	-1.4%	-1.4%	-1.4%	-1.4%	-1.4%
Government Foreign Interest Rate (IRFGadd) [4]	0.3%	0.3%	0.3%	0.3%	0.3%
Private Foreign Interest Rate (IRFPadd) [4]	0.6%	0.6%	0.6%	0.6%	0.6%

Footnotes: [1] Derived from the Socio-Economic Development Report, MPI (2006); [2] Assumption: Average 2003-2005 percentage change for Exchange Rate, Foreign Net Factor Payments and Private Net Foreign Transfers (Tables 5-6) imposed over 2006-2010 projection period; [3] Assumption: Growth rates for Government Transfers and Government Domestic Debt similar to overall SEDP Government Consumption growth rates; [4] Assumption: Average 2003-2005 interest rate levels (Tables 5-6) imposed over 2006-2010 projection period.

Table 5. Exogenous Variables (SEDP projection levels)

	2006	2007	2008	2009	2010
Agriculture GDP (AGDPgr) [1]	151,383	162,828	175,065	188,573	203,299
Industry GDP (IGDPgr) [1]	310,636	334,121	359,232	386,949	417,167
Service GDP (SGDPgr) [1]	311,557	335,112	360,297	388,096	418,405
Agriculture Exports (AXgr) [1]	8,766	10,170	11,788	13,651	16,052
Industry Exports (IXgr) [1]	25,081	29,096	33,724	39,054	45,924
Service Exports (SXgr) [1]	5,511	6,393	7,410	8,581	10,090
Exchange Rate (Egr) [2]	16,050	16,187	16,325	16,464	16,604
Import Price Index (MPIgr) [1]	1.04	1.06	1.07	1.09	1.11
Export Price Index (XPIgr) [1]	1.02	1.02	1.02	1.02	1.02
GDP Deflator (PDgr) [1]	1.25	1.35	1.44	1.55	1.66
Government Transfers (GTgr) [3]	140,500	142,362	150,048	159,738	170,355
Government Domestic Revenues (TGgr) [1]	231,000	257,500	288,500	323,000	360,000
Government Real Investment (IVGgr) [1]	61,408	63,770	66,982	69,139	71,835
Government Net Domestic Debt (NDDGgr) [3]	103,433	109,829	120,166	132,441	145,362
Foreign Net Factor Payments (NFPgr) [2]	-951	-1,159	-1,413	-1,722	-2,099
Government Net Foreign Transfers (NTRGgr) [1]	156	154	153	152	151
Private Net Foreign Transfers (NTRPgr) [2]	3,858	4,725	5,787	7,088	8,680
Foreign Direct Investment (FDIgr) [1]	1,956	2,642	3,569	4,821	6,512
Government Domestic Interest Rate (IRDGadd) [4]	1.4%	1.4%	1.4%	1.4%	1.4%
Government Foreign Interest Rate (IRFGadd) [4]	2.4%	2.4%	2.4%	2.4%	2.4%
Private Foreign Interest Rate (IRFPadd) [4]	5.3%	5.3%	5.3%	5.3%	5.3%

Footnotes: [1] Derived from the Socio-Economic Development Report, MPI (2006); [2] Assumption: Average 2003-2005 percentage change for Exchange Rate, Foreign Net Factor Payments and Private Net Foreign Transfers (Tables 5-6) imposed over 2006-2010 projection period; [3] Assumption: Growth rates for Government Transfers and Government Domestic Debt similar to overall SEDP Government Consumption growth rates; [4] Assumption: Average 2003-2005 interest rate levels (Tables 5-6) imposed over 2006-2010 projection period.

Table 6. GDP growth path
(SEDP Targets & Current Projections)

	2006	2007	2008	2009	2010	Total
Nominal GDP growth rate (SEDP Target)	15.8%	14.8-16.0%	14.9-15.9%	15.1-16.1%	15.1-16.2%	
Nominal GDP growth rate (Projections)	15.8%	15.4%	15.4%	15.6%	15.7%	
Nominal GDP (SEDP Target) [1]						6,528-6,674
Nominal GDP (Projections) [1]	970.0	1,119.5	1,291.5	1,492.7	1,726.8	6,600.5
Real GDP growth rate (SEDP Target)						7.5%-8.0%
Real GDP growth rate (Projections)	7.9%	7.6%	7.5%	7.7%	7.8%	7.5%-7.9%
GDP Deflator Growth Rate (Projections)	7.3%	7.3%	7.3%	7.3%	7.3%	

Source: MPI (2006) & own calculations.

Footnotes: [1] Trillions VND

Table 7. Export growth path
(SEDP Targets & Current Projections)

	2006	2007	2008	2009	2010
Nominal Export growth rate (SEDP Target)	15.5%	16.8%	16.7%	16.6%	18.4%
Nominal Export growth rate (Projections) [1]	10.9%	16.8%	16.7%	16.6%	18.4%
Nominal Exports (SEDP Target) [2]	646.2	754.9	881.1	1027.5	1216.7
Nominal Exports (Projections) [2]	646.2	754.9	881.1	1027.5	1216.7
Real Exports growth rate (Projections)	10.1%	16.0%	15.9%	15.8%	17.6%
Export Price Index Growth Rate (Projections)	-0.2%	-0.2%	-0.2%	-0.2%	-0.2%
Exchange Rate Depreciation (Projections)	0.9%	0.9%	0.9%	0.9%	0.9%

Source: MPI (2006) & own calculations.

Footnotes: [1] The Real exports growth rate for 2006 is not consistent with the SEDP target growth path, since preliminary 2005 exports in the SEDP report (559.3 Tr. VND) differ from final 2005 exports (582.7 Tr. VND/36.6 Bio. USD) according to IMF (2006).; [2] Trillions VND

Table 8. Government Revenue growth paths
(SEDP Targets & Current Projections)

	2006	2007	2008	2009	2010	Total
Government Domestic Income (SEDP Target) [1]	231.0	257.5	288.5	323.0	360.0	
Government Domestic Income (Projections) [1]	231.0	257.5	288.5	323.0	360.0	
Government Net Foreign Transfers (SEDP Target) [1]	2.5	2.5	2.5	2.5	2.5	
Government Net Foreign Transfers (Projections) [1]	2.5	2.5	2.5	2.5	2.5	
Government Revenue (SEDP Target) [1]						1,472.0
Government Revenue (Projections) [1]	233.5	260.0	291.0	325.5	362.5	1,472.5

Source: MPI (2006) & own calculations.

Footnotes: [1] Trillions VND

Table 9. Government Expenditure growth paths
(SEDP Targets & Current Projections)

	2006	2007	2008	2009	2010
Nominal Government Current Expenditure (SEDP Target) [1]	160	170	186	205	225
Nominal Government Consumption (SEDP Target) [1]	59	67	75-76	84-85	93-95
Nominal Government Transfers (SEDP Target) [1]	101	103	110-111	120-121	130-132
Nominal Government Off-budget Items [1][2]	39	39	39	39	39
Nominal Government Transfers incl. Off-budget Items (Projections) [1]	141	142	150	160	170
Nominal Government Investment (SEDP Target) [1]	80	90	101	113	125
Nominal Government Investment growth rate (SEDP Target)	4.1%	11.4%	12.7%	10.8%	11.5%
Real Government Investment growth rate (Projections) [3]	-0.2%	3.8%	5.0%	3.2%	3.9%

Source: MPI (2006) & own calculations.

Footnotes: [1] Trillions VND; [2] Government Off-budget expenditures during 2006-2010 is assumed to be unchanged from nominal off-budget expenditures in 2005; [3] The real government investment growth rates is derived by applying the GDP deflator growth path to the nominal government investment growth path; [4] The Real government investment growth rate for 2006 is not consistent with nominal government investment and GDP deflator growth, since preliminary 2005 government investment in the SEDP report (74.0 Tr. VND) differ from final 2005 government investment expenditures (71.9 Tr. VND) according to IMF (2006).

Table 10. Model Parameters (SEDP Base Scenario)

		2006	2007	2008	2009	2010
b	Private saving propensity	0.330	0.330	0.330	0.330	0.330
d	Ratio of reserve changes to import changes	0.192	0.192	0.192	0.192	0.192
g	Ratio of government net foreign debt to exports	0.377	0.377	0.377	0.377	0.377
k0	parameter relating investment to level of real GDP	0.19	0.19	0.19	0.19	0.19
k1	parameter relating investment to growth in real GDP	2.500	2.500	2.500	2.500	2.500
m0	Constant in import demand function	-3.01	-3.01	-3.01	-3.01	-3.01
m1	GDP elasticity of import demand	1.200	1.200	1.200	1.200	1.200
m2	Real exchange rate elasticity of import	-1.00	-1.00	-1.00	-1.00	-1.00
v	money velocity	1.21	1.21	1.21	1.21	1.21

Source: own calculations.
Note: In the Base Scenario, parameter values are equal to calibrated values for 2005. The only exception is the ratio of reserve changes to import changes (d), which is given the value 10/52. This is based on the assumption that the government has a long-run target of maintaining ForEx reserves equal to 10 weeks of imports

Table 11. SEDP Base Scenario
(Focal Variables)

	2006	2007	2008	2009	2010
Government Consumption [1]	59,206	71,369	76,301	77,181	65,765
Government Domestic Credit [2]	10,541	42,121	69,025	86,474	69,637
Private Domestic Credit [2]	576,373	643,691	730,266	845,146	1,015,421
Private Net Foreign Debt [3]	2,418	1,209	-785	-3,665	-9,305

Source: own calculations.
Footnotes: [1] Billions VND (2003 Prices); [2] Billions VND; [3] Millions USD

Table 12. SEDP Base Scenario
(Nominal National Accounts Aggregates)

	2006	2007	2008	2009	2010
Nominal GDP (projections)	970,000	1,119,500	1,291,500	1,492,700	1,726,750
Nominal Import Demand (SEDP target)	970,000	1,119,500	1,291,500	1,492,700	1,726,750
Nominal Consumption (projections)	695,359	809,368	933,945	1,075,155	1,220,867
Nominal Consumption (SEDP target)	669,000	770,590	886,530	1,020,030	1,175,650
Nominal Private Consumption (projections)	621,117	712,437	821,552	951,777	1,105,986
Nominal Private Consumption (SEDP target)	610,000	703,552	811,178	935,368	1,081,605
Nominal Government Consumption (projections)	74,242	96,931	112,393	123,378	114,881
Nominal Government Consumption (SEDP target)	59,000	67,038	75,352	84,663	94,046
Nominal Investment Demand (projections)	349,782	399,973	465,208	549,948	651,286
Nominal Investment Demand (SEDP target)	383,000	449,730	526,050	615,010	718,000
Nominal Exports Demand (projections)	646,200	754,900	881,100	1,027,500	1,216,700
Nominal Exports Demand (SEDP target)	646,200	754,900	881,100	1,027,500	1,216,700
Nominal Import Demand (projections)	721,341	844,741	988,753	1,159,903	1,362,103
Nominal Import Demand (SEDP target)	729,000	856,441	1,003,150	1,170,929	1,384,535

Source: MPI (2006) & own calculations.
Note: Aggregates are measured in Billions VND; SEDP target levels for resource balance components does not add up to SEDP target levels for GDP, since target levels are derived from target intervals.

Table 13. SEDP Base Scenario
(Accumulated Foreign Loan Disbursement 2006-2010)

	Projections	SEDP Target
Government Net Foreign Borrowing (2006-2010)	13,824	
Government Foreign Interest Payments (2006-2010)	2,194	
Government Foreign Loan Disbursement (2006-2010)		8,400
Government Foreign Loan Reimbursement & Interest Payments (2006-2010)		5,400
Government Net Foreign Loan Disbursement (2006-2010)	11,630	3,000
Private Net Foreign Borrowing (2006-2010)	-11,656	
Private Foreign Interest Payments (2006-2010)	57	
Private Foreign Loan Disbursement (2006-2010)		6,000
Private Foreign Loan Reimbursement & Interest Payments (2006-2010)		5,600
Private Net Foreign Loan Disbursement (2006-2010)	-11,713	400

Source: MPI (2006) & own calculations.
Note: Aggregates are measured in Billions VND.

Table 14. Model Parameters (SEDP Consistent Scenario)

		2006	2007	2008	2009	2010
b [1]	Private saving propensity	0.342	0.338	0.338	0.341	0.344
d [1]	Ratio of reserve changes to import changes	0.173	0.173	0.173	0.173	0.173
g [1]	Ratio of government net foreign debt to exports	0.353	0.328	0.304	0.279	0.255
k0	parameter relating investment to level of real GDP	0.19	0.19	0.19	0.19	0.19
k1 [1]	parameter relating investment to growth in real GDP	2.975	3.140	3.179	3.104	3.039
m0	Constant in import demand function	-3.01	-3.01	-3.01	-3.01	-3.01
m1 [1]	GDP elasticity of import demand	1.2008	1.2010	1.2011	1.2007	1.2012
m2	Real exchange rate elasticity of import	-1.00	-1.00	-1.00	-1.00	-1.00
V	money velocity	1.21	1.21	1.21	1.21	1.21

Source: own calculations.

Note: [1] Parameter has been adjusted relative to the constant parameter value in the SEDP Base Scenario, to make the projections consistent with SEDP target growth paths.

Table 15. Exogenous Variables (SEDP Consistent Scenario growth rates)

	2006	2007	2008	2009	2010
Agriculture GDP (AGDPgr)	7.9%	7.6%	7.5%	7.7%	7.8%
Industry GDP (IGDPgr)	7.9%	7.6%	7.5%	7.7%	7.8%
Service GDP (SGDPgr)	7.9%	7.6%	7.5%	7.7%	7.8%
Agriculture Exports (AXgr)	10.1%	16.0%	15.9%	15.8%	17.6%
Industry Exports (IXgr)	10.1%	16.0%	15.9%	15.8%	17.6%
Service Exports (SXgr)	10.1%	16.0%	15.9%	15.8%	17.6%
Exchange Rate (Egr)	0.9%	0.9%	0.9%	0.9%	0.9%
Import Price Index (MPIgr)	1.5%	1.5%	1.5%	1.5%	1.5%
Export Price Index (XPIgr)	-0.2%	-0.2%	-0.2%	-0.2%	-0.2%
GDP Deflator (PDgr)	7.3%	7.3%	7.3%	7.3%	7.3%
Government Transfers (GTgr)	3.5%	1.3%	5.4%	6.5%	6.6%
Government Domestic Revenues (TGgr)	7.5%	11.5%	12.0%	12.0%	11.5%
Government Real Investment (IVGgr)	-0.2%	3.8%	5.0%	3.2%	3.9%
Government Net Domestic Debt (NDDGgr) [1]	23.0%	27.8%	20.6%	16.2%	11.3%
Foreign Net Factor Payments (NFPgr)	21.9%	21.9%	21.9%	21.9%	21.9%
Government Net Foreign Transfers (NTRGgr)	7.8%	-0.8%	-0.8%	-0.8%	-0.8%
Private Net Foreign Transfers (NTRPgr)	22.5%	22.5%	22.5%	22.5%	22.5%
Foreign Direct Investment (FDIgr)	35.1%	35.1%	35.1%	35.1%	35.1%
Government Domestic Interest Rate (IRDGadd)	-1.4%	-1.4%	-1.4%	-1.4%	-1.4%
Government Foreign Interest Rate (IRFGadd)	0.3%	0.3%	0.3%	0.3%	0.3%
Private Foreign Interest Rate (IRFPadd)	0.6%	0.6%	0.6%	0.6%	0.6%

Source: MPI (2006) & own calculations.

Footnotes: [1] Growth rates have been adjusted relative to the growth rates in the SEDP Base Scenario, to make the projections consistent with SEDP target growth paths.

Table 16. SEDP Consistent Scenario
(Focal Variables)

	2006	2007	2008	2009	2010
Government Consumption [1]	47,749	50,005	51,980	53,786	54,687
Government Domestic Credit [2]	10,000	10,058	10,850	12,197	13,984
Private Domestic Credit [2]	577,603	678,064	793,008	927,826	1,081,371
Private Net Foreign Debt [3]	3,836	4,575	5,073	4,899	3,524

Source: own calculations.
Footnotes: [1] Billions VND (2003 Prices); [2] Billions VND; [3] Millions USD

Table 17. SEDP Consistent Scenario
(Nominal National Accounts Aggregates)

	2006	2007	2008	2009	2010
Nominal GDP (projections)	970,000	1,119,500	1,291,500	1,492,700	1,726,750
Nominal Import Demand (SEDP target)	970,000	1,119,500	1,291,500	1,492,700	1,726,750
Nominal Consumption (projections)	669,800	771,311	887,500	1,021,119	1,176,585
Nominal Consumption (SEDP target)	669,000	770,590	886,530	1,020,030	1,175,650
Nominal Private Consumption (projections)	610,000	703,552	811,178	935,368	1,081,605
Nominal Private Consumption (SEDP target)	610,000	703,552	811,178	935,368	1,081,605
Nominal Government Consumption (projections)	59,800	67,759	76,322	85,752	94,980
Nominal Government Consumption (SEDP target)	59,000	67,038	75,352	84,663	94,046
Nominal Investment Demand (projections)	383,000	449,730	526,050	615,010	718,000
Nominal Investment Demand (SEDP target)	383,000	449,730	526,050	615,010	718,000
Nominal Exports Demand (projections)	646,200	754,900	881,100	1,027,500	1,216,700
Nominal Exports Demand (SEDP target)	646,200	754,900	881,100	1,027,500	1,216,700
Nominal Import Demand (projections)	729,000	856,441	1,003,150	1,170,929	1,384,535
Nominal Import Demand (SEDP target)	729,000	856,441	1,003,150	1,170,929	1,384,535

Source: MPI (2006) & own calculations.
Note: Aggregates are measured in Billions VND; SEDP target levels for resource balance components does not add up to SEDP target levels for GDP, since target levels are derived from target intervals.

Table 18. SEDP Consistent Scenario
(Accumulated Foreign Loan Disbursement 2006-2010)

	Projections	SEDP Target
Government Net Foreign Borrowing (2006-2010)	4,871	
Government Foreign Interest Payments (2006-2010)	1,871	
Government Foreign Loan Disbursement (2006-2010)		8,400
Government Foreign Loan Reimbursement & Interest Payments (2006-2010)		5,400
Government Net Foreign Loan Disbursement (2006-2010)	3,000	3,000
Private Net Foreign Borrowing (2006-2010)	1,173	
Private Foreign Interest Payments (2006-2010)	773	
Private Foreign Loan Disbursement (2006-2010)		6,000
Private Foreign Loan Reimbursement & Interest Payments (2006-2010)		5,600
Private Net Foreign Loan Disbursement (2006-2010)	400	400

Source: MPI (2006) & own calculations.
Note: Aggregates are measured in Billions VND.