The Cadiz City Fishing Port Complex Project

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Abstract

The Nationwide Fishing Ports Development Project (also called the Fishing Ports Project, Package II) is a major undertaking of the Philippine Government to establish the necessary network of facilities that will encourage higher and more efficient fish production in the country. The project involves development of commercial and municipal fishing port complexes in identified regional consumption centers. The project is part of the Integrated Fishery Development Plan, a component plan of the country's 1992-1996 medium term economic development plan.

This paper evaluates the government's plan to implement the fishing port complex project in Cadiz City. The proponents of the project are the Philippine Department of Transportation and Communication (DOTC) and the Philippine Fisheries Development Authority (PFDA), a government-owned and controlled corporation (GOCC) under the jurisdiction of the Department of Agriculture.

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I. Introduction

The archipelagic geographical configuration of the Philippines is a natural explanation of why fishing is an important economic activity in the Philippines. But more substantively in the last twenty years, fisheries production has consistently contributed a significant part to the country's gross value added in agriculture. Along with agriculture and forestry, it has also historically been the largest employer-sector and has accounted for over a third of gross domestic product[1].

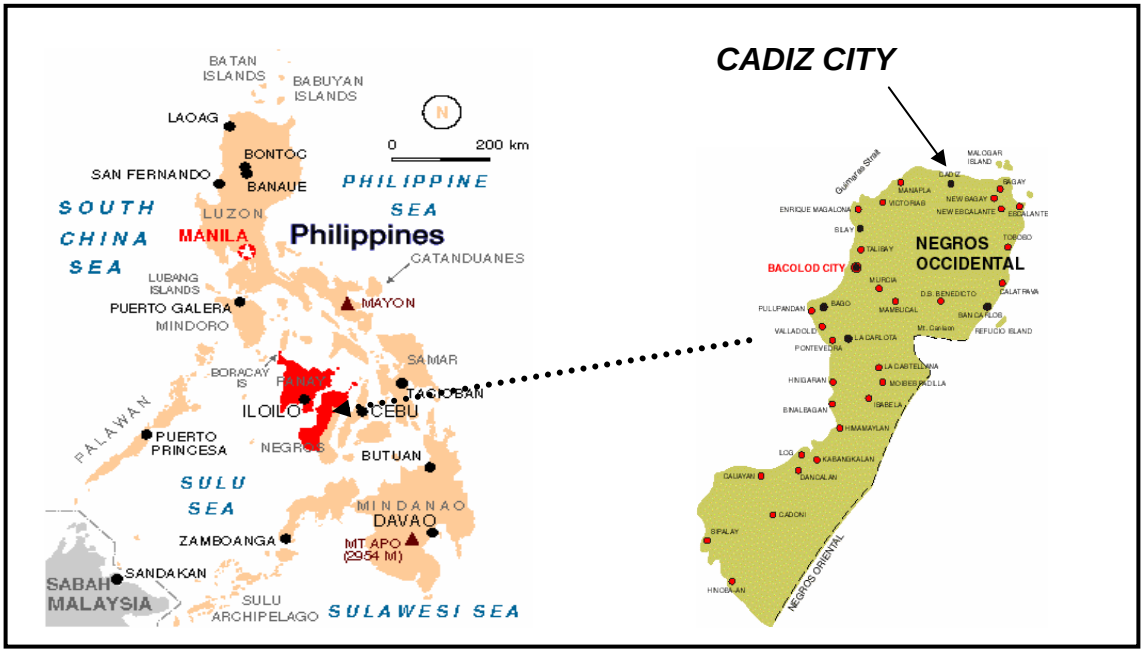
Despite its vast aquatic and marine resources, there is a marked difference in fishery output among the country's regional geographic groupings. The lack of post-harvest infrastructure such as ports, handling, processing, and storage facilities, has been a serious constraint for improving productivity and output. Because of its significant role in national economic development, government has invariably taken efforts to fulfill the requirements of the sector, particularly infrastructure.

The Nationwide Fishing Ports Development Project (also called the Fishing Ports Project, Package II) is a major undertaking of the Philippine Government to establish the necessary network of facilities that will encourage higher and more efficient fish production in the country. The project involves development of commercial and municipal fishing port complexes in identified regional consumption centers. The project is part of the Integrated Fishery Development Plan, a component plan of the country's 1992-1996 medium term economic development plan.

[1] *Supporting data obtained from the web site of the National Statistical Coordination Board. NSCB): www.nscb.org.ph.*

One of the four regional centers that has been selected for fishing port development under this package is Cadiz City, located in the northern part of the Region 6 - Negros Occidental Region (See Figure 1). The Cadiz City Fish Port will be located in Kabahug Extension, within the vicinity of the city's commercial district and current fish landing site. The establishment of the port in the city is expected to accelerate growth of fishery activities and efficiently take advantage of the existing marketing network in the other cities of the Visayas regions e.g. Iloilo City and Cebu City, which have already fully developed commercial port complexes.

FIGURE 1: MAP OF THE PHILIPPINES AND CADIZ CITY



This paper evaluates the government's plan to implement the fishing port complex project in Cadiz City. The proponents of the project are the Philippine Department of Transportation and Communication (DOTC) and the Philippine Fisheries Development Authority (PFDA), a government-owned and controlled corporation (GOCC) under the jurisdiction of the Department of Agriculture.

II. Project Description

The primary objective of the project is to stimulate higher marine and inland fishery production in Cadiz City and to enhance its fish marketing system. It is envisioned that with the fishing port complex, there will be an improvement in:

- the efficiency of fishery unloading operations;
- the availability and quality of shelter, maintenance, and repair facilities for fishing vessels;
- the quality and marketability of fish catch;
- the adequacy of facilities and technology for processing, storing, and distributing fishery products;
- the efficiency of product handling procedures; and
- the turnaround time of fishing vessels.

To achieve these objectives, the project will establish basic and functional port facilities (i.e., marine and land structures), that will enable Cadiz City to meet its present and future needs for becoming an efficient marketing center for fishery products in the region. Specifically, the Cadiz City port complex will be provided with landing quays, berthing and service piers, refrigeration facilities (e.g. ice plants, cold storage, and contact freezers), market halls, gear sheds, and boat repair facilities. Back up areas shall also be available for facilities that may be installed for integration of fishery and related activities.

III. Integrated Financial, Economic, and Stakeholder Analyses

The evaluation approach for the project assumes that it is an entirely new investment and that all sources of revenue and economic benefits reported in the DOTC/PFDA proposal are incremental to the pre-project scenario. Ideally, given that there are already existing fish landing and marketing activities in the city, all benefits and costs evaluated in the project should be verified as to whether they are incremental or accrued. This is to ensure that only the net valued added of the project is being accounted for.

The evaluation of the project has four integrated parts, which are undertaken sequentially as follows:

Part 1: Financial Analysis

Using the discounted cash flow approach, financial analysis establishes the project's net financial benefits. A deterministic[2] net cash flow is constructed to indicate the project's annual capacity to sustain operations and pay off its debts. The first step in the financial analysis of this project is the identification of its relevant data and assumptions in a parameter table. The parameter table includes all technical, marketing, industry, macroeconomic, and all other critical quantified information that have impact on the fishing port and its operations. The intermediate steps involve the construction of inflation indices and nominal or inflation-adjusted working tables for the various inflow and outflow items. The inflation-adjusted (nominal) working tables include the following: investment and depreciation, revenues, recurrent costs, working capital, loan schedule, and income statement. Since the project produces services, it is not necessary to prepare either an input or output inventory table.

[2] *Deterministic here means that minimal or no consideration is made so far on the possibility that the project's various inflows and outflows may be subject to some random behavior caused by*

The loan schedule and income statement are prepared to determine the project's debt repayment and tax liability, respectively. Given that PFDA is a GOCC, and may therefore be exempt from payment of corporation taxes, the income statement is optional in the context of this project. However, to account for the full financial costs of the project and to provide for the possibility that a private concessionaire may at some future point in time operate the fishing port, the income tax liability is estimated and included as an outflow item in this evaluation.

From both the total investment and owner's perspectives, cash flows are prepared to provide a comparison of how the project's cash flow structure changes with and without specific reference to financing sources. The total investment or banker's point-of-view evaluates the project from an unleveraged (without debt) perspective while the owner's or equity point-of-view looks at the project with the proposed OECF financing. Since the primary interest of government in the financial evaluation of the project is to examine its operational sustainability beyond the investment years (year 0 to year 2), the calculation of both the project's net present value (NPV) and internal rate of return (IRR), as traditionally practiced in the NEDA project evaluation methodology, is not made at this point. The critical bottom line in the financial analysis of this project is basically the annual net cash flows.

A further step that is made after establishing the project's net cash flows is a sensitivity analysis. Sensitivity analysis determines the impact of changes in specific parameters of the project to the net cash flows on critical years of its operations. Variables such as domestic inflation, change in demand, electricity cost, and investment cost overrun are tested for their effects on net cash flows. This procedure also enables pre-identification of the variables that may have the strongest effect on the variability of the project's outcomes. The sensitivity

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factors outside of the project's control. The financial analysis parameters and outcomes are also referred to in this evaluation as base values.

variables that have the perceived strongest effect are then selected as the risk variables in risk analysis.

Part 2: Economic analysis

Economic analysis determines the project's viability from the viewpoint of the country or the whole economy by taking the NPV of its economic resource flow. The NPV is calculated using the economic opportunity cost of capital as the discount rate. A positive economic NPV means that the project results in improved welfare/wealth for the country. Unlike a financial analysis, the economic analysis not only quantifies the financial benefits and costs that are emanating directly from operations of the fishing port and accruing to the owner (PFDA/DOTC). It also extends valuation to so-called positive and negative externalities of the project and to other direct benefits and costs that affect for instance, specific stakeholders such as the government, fishermen, fish traders, labor, and landowners.

Externalities occur because the true values/prices of inputs and outputs of any given project are disguised by the presence of distortions such as taxes, tariffs, subsidies, monopoly power, and quantitative restrictions/ quotas. In this project, tariffs, value-added taxes, and personal income taxes are major sources of differences in the economic and financial prices of both tradable and non-tradable inputs used, including labor. The economic analysis will ensure that these externalities are correctly reflected in estimating the project's economic NPV. As for stakeholder-specific benefits and costs for this project, time-savings, increased income for fishermen, improved quality of fish for consumers, are among the many economic gains that are economic outputs of the project and are estimated in constructing the economic net benefits of the project[3].

[3] *These benefits are quantified in the project's economic resource flow using formulas provided in the implementation program section of the DOTC document and figures provided in the NEDA ICC-TB evaluation report These benefits will be discussed in more detail in a subsequent section on the results of the economic analysis.*

The economic resource flow of this project emanates directly from its financial cash flow. The main difference stems from the use of commodity-specific conversion factors. The CSCF's are calculated as ratios of the economic and financial prices for each line item in the project's financial cash flow. Calculation methodology of the economic prices differs depending on whether an output or input is tradable or non-tradable. The economic opportunity cost of foreign exchange or the foreign exchange premium is applied on all tradable items. In this project, economic prices are derived for composite goods (e.g. civil and building works) as well. These are items consisting of several intermediate inputs (like cement, lumber, aggregates, equipment) with individual distortions in their financial prices. The economic price for labor is determined in various ways depending on whether it is skilled, unskilled or foreign. For both domestic skilled and unskilled labor, since they receive above market wages (with the project) but pay personal taxes in both the pre-project and project employment scenario, the economic price accounts for the tax differential and wage premium. For foreign labor, the foreign exchange premium on repatriated income and taxes paid (personal and VAT) are accounted for in calculating economic price.

Part 3: Distributive or Stakeholder Analysis

Distributive analysis identifies the gainers and losers from the project outside of the owners (DOTC and PFDA) or its financial sponsors (OECF). This analysis uses both the financial cash flow and the economic resource flow to define the project's statement of externalities and to obtain the NPV of the externalities. The statement of externalities, which is the difference of each line item between the economic and the financial flows, reflects the extent to which distortions in the financial prices are translated into benefits or costs for particular stakeholders. The stakeholders identified in this project include government, fishermen, fish traders, labor, and owners of land contiguous to the port complex.

Part 4: Risk Analysis

Risk analysis is conducted when all the critical outcomes of the project evaluation are established. It allows decision-makers to assess the potential variability of key project variables and their effects on the project's financial, economic, and distributive outcomes. Specifically, the net present values (NPV) of the project's financial cash flow, the economic resource flow, and statement of externalities (all evaluated at the economic opportunity cost of capital of 10.3%) are tested for variability to changes in the risk environment of the project. Project parameters that are used as risk variables include domestic inflation, investment cost overrun, and change in demand for port facilities and services. A Monte Carlo simulation is then used to model the likely distribution of these risk variables and the NPVs. A direct practical application of the results of risk analysis is the insight it offers in designing or approving the contractual terms with input suppliers (e.g., the electric cooperative that supplies power) and users of the port's facilities (i.e., the fishermen and fish traders).

Part 1: Financial Analysis

A. Investment and Operating Parameters[4]

1. The main investment components of the project are the acquisition of land/right-of-way, preparatory works, construction of civil and basic port facilities, setting up of the functional port facilities, and consultancy services. The consultancy services are inherent to the OECF financing of the project and includes hiring of experts for the pre-project engineering and technical studies. Total investment requirement of the in year 0 prices is **₱ 690.24 Million**. An investment phasing of 20%-40%-40% is assumed. Each component is also broken up into its sub-components to facilitate calculation of the commodity specific conversion factors in the economic analysis. Table 1 shows the breakdown of the investment cost.
2. The project construction period spans 3 years (years 0 to 2), but the port complex itself could have a maximum economic life of 50 years. For purposes of the evaluation, however, the project's operational life will be limited to 22 years, with a provision for liquidation in year 23.
3. The project is being proposed for funding under the 22nd Yen Credit Package of the Japanese Overseas Economic Cooperation Fund (OECF). The OECF loan, which amounts to ₱ 496.8 Million will be disbursed from year 0 to year 2 following the investment phasing. It carries a real interest rate of 2.7% per annum. There is a 10-year grace period on payment of principal, after the first tranche of the loan is disbursed in year 0. The repayment period for the entire loan with its accrued interest is 10 years, starting from year 10. The rest of the investment requirements are expected to come from the proponents' government budgetary appropriations.

[4] *The parameters used in this project are directly obtained from the DOTC and DA documents provided by the NEDA or are provided by NEDA technical staff. Where data are missing from the project documents, the values are assumed by the authors for illustrative purposes.*

4. The real values of the fees for all of the port facilities and services and demand levels are expected to remain constant over the 22-year project period at their year 0 levels. There are 18 sources of operating revenues in the project. These are as follows:

- Port entry fee
- Fish unloading fee
- Road vehicle entrance
- Contact freezer rental
- Processing area rental
- Ice sales
- Ice conveyance fee
- Stall rental
- Land space rental
- Berthing and lay-by fee
- Market fee
- Parking Fee
- Cold storage rental
- Forklift rental
- Freshwater sales
- Water conveyance fee
- Building space rental
- Expansion land space rental

(Details of real revenues are shown in Table 2.)

5. The utilized capacity of the port complex is assumed to stay constant at 85% during the project's operational life and all rental spaces are assumed to be 100% occupied full time.
6. All input costs are already expressed in domestic market prices and assumed to be inclusive of all tariffs and taxes paid on the goods. Except for manpower expenses, all input costs are expected to have zero real growth in the prices.
7. Labor as input is separated into 3 categories: skilled, unskilled, and foreign. Foreign labor is assumed to repatriate 80% of their income.
8. Although PFDA is a tax-exempt government-owned and controlled corporation, for illustrative purposes, provision is made for payment of a 35% income tax. A VAT of 10% is also paid on its gross revenues.

TABLE 1: INVESTMENT COMPONENTS

(In Real Pesos of 1995)

		Total	Year 0	Year 1	Year 2
Land Acquisition/Right of Way		2000000	2000000		
Phasing of investment			20%	40%	40%
Preparatory works		28434524	5686905	11373810	11373810
Mobilisation/ demobilisation		10006000	2001200	4002400	4002400
Temporary works		16130157	3226031	6452063	6452063
Site survey		2298367	459673	919347	919347
Civil and building works, & basic port facilities*	Share	491105374	988221075	196442150	196442150
Labour	17%	83194628	16638926	33277851	33277851
Building and civil works equipment	29%	143274399	28654880	57309760	57309760
Automotive fuel	12%	60284459	12056892	24113784	24113784
Cement	22%	106806539	21361272	42722544	42722544
Aggregates	11%	55533279	11106656	22213311	22213311
Lumber	1%	5858591	1171718	2343436	2343436
Reinforcing steel	4%	20402450	4080490	8160980	8160980
Plumbing materials	3%	15751209	3150242	6300484	6300484
Port functional facilities*	Share	113000000	22600000	45200000	45200000
Electrical works	32%	36000000	7200000	14400000	14400000
Refrigeration facilities	32%	36000000	7200000	14400000	14400000
Cargo handling equipment	14%	16342902	3268580	6537161	6537161
Water supply works	20%	23000000	4600000	9200000	9200000
Incinerator	2%	1657098	331420	662839	662839
*Includes installation, handling & transport					
Consultancy services		55700000	11140000	22280000	22280000
Grand total		690239898	145767095	287534189	287534189

- The basic port facilities that will be constructed include a landing quay, wharf structures, breakwaters, dredging and reclamation works, revetment works, and causeway construction.

TABLE 2: SUMMARY OF PORT REVENUES

(In Nominal Million Pesos)

Source	Year 3…	Year 10…	Year 15…	Year 22
Port entry fee	0.14	0.24	0.35	0.60
Berthing & lay-by fee	0.24	0.42	0.61	1.05
Fish unloading fee	5.29	9.07	13.32	22.83
Market fee	13.23	22.67	33.31	57.08
Entrance fee	0.48	0.82	1.21	2.07
Parking fee	2.03	3.47	5.11	8.75
Contact freezer rental	3.43	5.88	8.63	14.8
Cold storage rental	1.87	3.21	4.72	8.09
Processing area rental	1.07	1.84	2.70	4.63
Forklift rental	1.97	3.37	4.95	8.48
Ice sales	15.24	26.12	38.38	65.78
Freshwater sales	0.39	0.66	0.97	1.66
Ice conveyance fee	0.85	1.45	2.13	3.65
Water conveyance fee	0.17	0.29	0.42	0.72
Stall rental	1.81	3.11	4.57	7.83
Building space rental	2.04	3.50	5.15	8.83
Land space rental	41.00	70.26	103.24	176.93
Expansion land space rental	18.37	31.48	46.25	79.26
Total Revenues	**109.61**	**187.58**	**276.02**	**473.04**

B. Constructing the Pre-Cash flow tables

There are eight pre-cash flow tables for this project (jncluding the parameter table), that are built up preparatory to the construction of the nominal cash flows, both from the total investment and owner's perspectives. These are the:

1. Inflation Indices and Nominal Exchange Rates
2. Nominal Investment and Depreciation
3. Nominal Loan Schedule
4. Nominal Revenues
5. Nominal Recurrent Costs
6. Nominal Working Capital
7. Income Tax Calculation

1. Inflation Indices and Nominal Exchange Rates

The following assumptions are used as basic information:

- domestic inflation rate of 8%
- foreign inflation rate of 3% (US inflation is used because the tradable items are originally quoted in dollar prices at the world market)
- official peso-dollar exchange rate (OER) of ₱ 39/$1
- c, the coefficient of appreciation/depreciation of exchange rate is 0%

There are three inflation indices and they are calculated annually as follows from year 0 to year 23:

=>	**Domestic inflation Index (DII):**	**$(1+ \text{Domestic inflation rate})^{year}$**
=>	**Foreign inflation Index (FII):**	**$(1+ \text{Foreign inflation rate})^{year}$**
=>	**Relative Inflation Index (RII):**	**DII / FII**

The domestic inflation index is used to adjust the values of the investments, revenues, and the recurrent costs for inflation. The foreign inflation index is mainly used in calculating the relative inflation index, which, in turn, is used to project the nominal or market exchange rate. The adjusted nominal exchange rate (ANER) is calculated as follows:

=> ANER: $OER * (1+ c)^{year} * RII$

The nominal exchange rate is used to convert the prices of imported inputs or exported outputs in local currency terms. In this project, however, we are dealing with prices and costs that already denominated in pesos terms, so the ANER calculation is mainly for illustrative purposes.

2. Nominal Investment and Depreciation

The nominal investment schedule is derived by multiplying each investment component with the corresponding annual domestic inflation index. In the deterministic financial case, the investment cost requirements are assumed to be completely accounted for. However, in order to accommodate for a possible upward adjustment in costs (i.e. when sensitivity analysis and risk analysis is done) due to unforeseen events, we build into the calculation an investment cost overrun factor (COF). The nominal investment is computed as follows:

=> Nominal Investment Cost: Real Cost * DII * (1+ COF)

The annual depreciation (AD) of each investment item is calculated using straight-line method, i.e. dividing the investment cost by years of economic life. The salvage value in year 23 is then estimated by taking the difference between total investment costs (TIC) and total depreciation for 20 years of operation, and adjusted for inflation in year 23.

=> Annual Depreciation:	**Investment Cost / Economic Life**
=> Salvage Value:	**(TIC – Total AD* 20 years) * DII Y-23**

3. Nominal Loan Schedule

In constructing the loan schedule we note that the real interest rate of 2.7% needs to be adjusted for inflation before we can calculate the interest payments. This is done as follows:

=> Nominal interest rate (i_n): [(1+ real interest rate) * (1 + inflation rate)] - 1

Repayment of the loan starts in year 10, i.e., ten years after the first disbursement, and is calculated as a fixed annual payment based on the opening balance of the loan for that year (OB_{10}), which consists of the principal amount and interest accrued in the prior 9 years[5].

4. Nominal Revenues

In preparing the nominal revenue table, we use the individual fee rates for each type of port services and adjust for annual inflation. Since there is no expected real change in the fee structure over time and in the demand for the port services, the increase in the port revenues will come solely from inflation. For purposes of sensitivity and risk analyses, however, we adjust the revenue streams for the possibility that there will be a shortfall in expected demand. A demand factor with a deterministic or base value of 0% is incorporated in the revenue calculation. Ideally, the adjustment should be made on quantity demanded for each port service/facility. But since there are 18 sources of revenues for this project, the adjustment is made instead on the total revenue line for computational facility and is interpreted as a generalized shortfall in revenue targets. The nominal revenue (NR) and adjusted total revenues (TR) equations are as follows:

=> NR per source:	**Per unit fee/Rental * Quantity demanded * DII**
=> Adjusted TR:	**Sum of NR of all sources * (1+ demand factor)**

The highest sources of revenues for the project are the land space rental activities (54%), the sale of ice (14%), and the collection of market entrance fees (12%)

[5] *The annual repayments are calculated using Excel's payment function as follows:*
=> Annual repayment: = - PMT (i_n, Repayment period, OB_{10})

5. Nominal Recurrent Costs

There are five types of recurrent costs in the project: electricity (59%), water (8%), materials(3%), manpower (27%), and administrative (3%). The nominal cost streams are obtained by adjusting the real costs with the annual inflation index. Since it is expected that all input costs other than labor will not grow in real terms, then the increase in recurrent costs over the 20-year project period will come from inflation. Nominal recurrent costs are calculated as follows:

=> **Nominal cost: Per unit price * Quantity demanded * DII**

6. Nominal Working Capital

The working capital schedule consists of the project's accounts receivables, accounts payables, and cash balances. Accounts receivables (AR) are assumed to be 5% of sales revenues; accounts payables (AP) are 10% of total electricity, water , and materials costs; and cash balances (CB) are 5% of total recurrent costs. Initial working capital for years 0 to 3 are assumed to be incorporated in the equity contribution of the proponents and therefore not included as a separate item.

The changes in working capital are the items that go into the expenditure side of the cash flow. Since the base figures for each of the working capital components are already in nominal terms, it is not correct to adjust them again for inflation. The changes in working capital are calculated as follows:

$$\Rightarrow \quad \Delta AR = AR_{t-1} - AR_t$$

$$\Rightarrow \quad \Delta AP = AP_{t-1} - AP_t$$

$$\Rightarrow \quad \Delta CB = CB_t - CB_{t-1}$$

7. Income Tax Calculation

The income tax of the project is calculated from its income statement, using all nominal figures obtained from the previous working tables. Although it is optional for this project because PFDA may be exempted from payment of corporation income tax, we derive it more for illustrative purposes. The income tax liability is calculated as follows:

	Gross revenues
Less:	**Recurrent costs**
	Earnings before interest and taxes (EBIT)
Less:	**Interest expense**
	Depreciation expense
	Earnings before taxes (EBT)
Add:	**Carry Forward Losses**
	Taxable Income
Less:	***Income tax liability (@ 35%)***
	Net profit after tax

The project's income statement shows positive net profit after taxes, that is, it appears to be a viable operation even after payment of corporation taxes. Although this is indicative of the operating sustainability of the project, it is not a sufficient basis for accepting the project.

C. Results of the Financial Analysis

The results of the financial analysis are summarized in the financial cash flows, which are constructed from both the total investment and owner's perspectives. For each point of view, a nominal and real cash flow is prepared. It is necessary to work first with the nominal cash flow to ensure that the impact of inflation is

captured in the working capital and interest expenses of the project. The real cash flow is then derived by dividing each cash flow line with the domestic inflation index. The total investment nominal cash flow is a logical starting point in-as-much-as it includes most of the items that are necessary to evaluate the project's net cash flow. Constructing the owner's cash flow is then simply a matter of adding the loan items, i.e., inflows – loan proceeds and outflows – loan repayments, and recalculating the net cash flows.

Generally, a financial NPV or IRR may be calculated to get a summary statistic of a project's financial viability. Deriving the NPV would require determining appropriate financial discount rates that reflect the varying debt-to-equity ratio of the project over its 22 year duration to evaluate the project's net benefits at year zero. In this case, however, since we are mainly interested in the project's operating sustainability, i.e., the generation of positive net cash flows, during its operational life, then it is not necessary to calculate the NPV nor the IRR at this stage.

From a total investment perspective, the project appears to be operationally sustainable from year 3 to year 22. However, from a leveraged position (owner's poin-of-view) the project appears to be in a critical condition, as the net cash flows become consistently negative during the first four years (years 10 to 13) that the OECF loan is being paid. What this implies is that PFDA, would have to plan ahead in terms of managing its corporate cash position in order to continue operating the port complex at the planned utilization capacity and to meet its revenue targets for the subsequent years. See Table 3 for a summary of the net cash flows.

An important qualification in using the project's net cash flow structure as indicator for operating sustainability is that it does not clearly answer the question of how the investment costs will be recouped. It is not advisable to forget about the negative net cash flows arising from the investment costs in year 0 to year 2.

If this project were to be evaluated as a purely financial undertaking the investments costs would weigh heavily in deciding whether to proceed with it or not. As a public sector project, however, that is geared towards the larger goal of improving economic welfare, the financial NPV calculation can be made secondary to the economic NPV and the externalities NPV. In this analysis, we assume that government is politically prepared to bear the costs of the investments, provided the economic and distributive analysis will show that the project increases net welfare to the economy and is able to address the needs of the targeted stakeholders.

TABLE 3: SUMMARY OF NET CASH FLOWS

(In Million Pesos)

	Year 0	Year 1	Year 2	Year 3	Year 8
TI- Nominal	-139.65	-297.32	-321.11	58.81	89.34
TI - Real	-139.65	-275.30	-275.30	46.69	48.27
O - Nominal	-40.29	-98.60	-122.39	58.81	89.38
O - Real	-40.29	-91.3	-104.93	46.69	48.27

	Year 10	Year 13	Year 15	Year 20	Year 23
TI- Nominal	145.38	161.06	173.23	210.70	1469.09
TI - Real	67.34	59.22	54.61	45.20	250.21
O - Nominal	-43.79	-28.12	-15.95	210.70	1469.09
O - Real	-20.28	-10.34	-5.03	45.20	250.21

D. Sensitivity Analysis

The financial net cash flows of the project are tested for responsiveness to changes in the values of key project variables using sensitivity analysis[6]. In the absence of an NPV measure, specific annual net cash flow results are used as forecasts. The following variables are evaluated for their impacts on the net cash flows:

- Domestic inflation rate
- Change in total trips of fishermen per year
- Change in occupancy rate of land spaces
- Change in capacity utilization of ice plant
- Change in demand for port services & facilities
- Change in real cost of electricity
- Change in real cost of manpower
- Investment Cost Overrun

Table 4 provides a summary of the sensitivity analysis results. The minimum and maximum values for the values or change in values of the sensitivity variables and the corresponding net cash flows in years 0, 3, 10, 15, and 19 are shown.

Domestic Inflation Rate: The financial outcome of the project is sensitive to domestic inflation. Generally, when the inflation rate goes up, the real value of the net cash flows decrease. Thus it is shown that for both years 3 and 19, when inflation increases from 0% to 20%, the real value of the net cash flows decrease by 4.7% and 14.8%, respectively. In year 10, however, which is the first year for repayment of the OECF loan, a higher inflation rate causes the real net cash flow to increase. Higher inflation accelerates the amortization schedule for the loan. The higher interest payments, then leads to lower corporate tax expenses for the project. A lower tax liability in turn increases the net cash flow for that year.

Total trips per year: The financial outcome is not sensitive to changes in total trips of fishermen who use the port per year. The number of trips affects the

[6] *This is faciliatted using the Data-Table function in Excel.*

project's revenue stream through the collection of port entry, lay-by and berthing fee, the sale of freshwater, and the conveyance of ice and water. These account for only 1.75% of the port's revenues, thus explaining the low sensitivity of the project's net cash flow even when the total number of trips drops or increases by 40%.

Occupancy rate of land spaces: The rental of land spaces comprises over 50% of the port's revenues. The deterministic case assumes that the entire 112,800 square meters of space will be rented out, but which may not be realized. A sensitivity test, that allows the occupancy rate to decrease by up 70% shows that project's financial outcome is responsive but not to the extent that net cash flows becomes negative, i.e., it only goes down by 35%.

Ice plant capacity utilization and Real cost of electricity: Electricity costs account for about 60% of total recurrent costs, thus it is important to determine the extent to which it affects the port's financial outcome. Neither a lower utilization rate for the ice plant nor a real decrease in electricity cost translates into significantly higher net cash flows for the project. This may be explained by the fact that the port runs on a low operating cost, relative to the revenues it generates every year. On average, the operating cost-to-gross revenue ratio is about 14, meaning revenues are 14 times as much as the recurrent costs. Thus even when electricity costs go up to 10% or the utilization capacity increases to 100%, there is no expected significant decrease in the project's financial outcome.

Change in demand for the port's services & facilities: The project is sensitive to changes in the overall demand for port services and facilities. A 50% drop in demand can lead to an average decrease of almost same magnitude in the net cash flows of years 3, 10, and 19. This is critical for the project because the assumption of fixed port fees over time (in the project's revenue projections) means that demand for port services and facilities is the main determinant of the

project's ability to generate revenues. In years 10 to 20, which is the loan repayment period, it is particularly important to generate sufficient cash flows for amortizing the debt.

Real cost of manpower: Manpower expenses account for 26% of the port's recurrent costs. For the same reasoning that changes in electricity costs do not significantly affect the project's financial outcome, real changes in manpower cost also do not result in significantly lower net cash flows for the project.

Investment cost overrun: Beyond the construction period the project does not appear to be sensitive to investment cost overrun. The positive effect on the net cash flows of years 10 and 20 are linked to higher depreciation expenses that translate into lower income tax liability for the project. At this point the overall impact on project viability is ambiguous. But given that investment costs do play a major role in determining the project's bottom line, it is worth exploring in the risk analysis whether changes in investment costs will in fact reduce net welfare for the economy.

TABLE 4: RESULTS OF SENSITIVITY ANALYSIS

Variable	Changes Min Max	Net cash flows (In Million Pesos)		
		Year 3* Base: 46.69	Year 10* Base: 67.34	Year 19 Base: 46.88
Domestic inflation rate	0%	47.73	57.65	52.41
(Base: 8%)	20%	45.50	71.24	44.63
Total trips per year	-40%	46.40	67.03	46.57
(Base 0%)	40%	46.97	67.65	47.19
Occupancy rate of land spaces	-70%	30.19	42.07	28.86
(Base 100%)	0%	46.69	67.34	46.88
Ice plant capacity utilization	40%	47.87	68.61	48.15
(Base: 85%)	85%	46.69	67.34	46.88
Demand for port services	-50%	24.93	32.64	23.11
(Base: 0%)	20%	55.39	76.85	56.39
Real cost of electricity	-5%	46.80	67.46	47.00
(Base: 0%)	10%	46.46	67.10	46.64
Real cost of manpower	-1%	46.75	67.55	47.29
(Base: 1%)	5%	46.54	66.78	45.47
Investment Cost Overrun	0%	-139.65	54.61	46.88
(Base: 0%)	50%	-209.47	56.02	47.92

** Except in the case of investment cost overrun, this will be year 0 and year 15, respectively.*

Part 2: Economic Analysis

The first step in economic analysis is the estimation of the economic prices of the project's main outputs and inputs, including the economic price of labor. Since the national parameters, i.e., the economic opportunity cost of foreign exchange and economic opportunity cost of capital are already calculated in the previous chapters of the manual, they are simply applied in this part of the project evaluation. Once the economic prices are derived, the specific conversion factors of each item in the project's cash flow can then be obtained.

There are four types of distortions that affect the project, which cause the financial prices of its output and inputs to be different from their economic prices. These are tariffs, value added taxes, personal income taxes, and subsidy. The economic price of project items affected by any of these must be adjusted to account for their true economic value. Tradable inputs of the project are also adjusted for a 15.24% foreign exchange premium.

A. Economic benefits of the project

The gross economic benefits of the project over the 20-year project period is ₱ 2,004 Million. There are four sources of these benefits: (1) revenues from port operations, (2) change in accounts receivables, (3) salvage value of the investments, and (4) stakeholder-specific direct benefits.

Port revenues: The domestic consumption of the port facilities by fishermen, fish traders, and other fishery-related businesses in Cadiz has a slightly lower economic value than the financial value. This is because of value added taxes that are collected by government from PFDA. The economic value of the port revenues is a weighted average[7] of the gross-of-VAT revenues (i.e., additional

[7] *Elasticities of demand and supply, which are assumed, as in other items of the cashflow, are used to calculate the weights. Ideally, elasticities should be determined from reql market price and quantity data.*

consumption benefits for the fishermen and fish traders who will use the port's facilities and services) and the net-of-VAT revenues (i.e., resource savings of producers of "fish landing and marketing services" prior to the project).

Change in accounts receivable: The economic valuation of change in accounts receivables mirrors that of port revenues because it is a derivative item. Thus it uses the conversion factor for port revenues in calculating economic value.

Salvage value: The economic value of remaining assets uses the conversion factor for civil and building works and port facilities inasmuch as this component comprises a significant part of the total book value of the port's assets in year 23.

Stakeholder-specific direct benefits: These are the other direct benefits that occur due to construction of the port complex, which are accounted for in the economic resource flow but not in the financial cash flow. The net present value of these direct economic benefits over the 20-year operational life of the project is almost ₱1,395 Million. This comprises approximately 70% of the gross economic benefits that are expected from the project. These include the following[8]:

- **Improvement in the preservation of freshness of fish products, which results in higher market prices.** These are due to more efficient handling and unloading of fish, the availability of sufficient supply of ice, and the availability of facilities for preservation of unsold fish. As a consequence, fishermen are also able to expand their markets and this is seen in an expected increase of supply of fresh fish to urban areas, where prices are higher.
- **Time-Savings benefits** consisting of three parts: savings due to cancellation of double handling/unloading of fish catch, savings due to shorter time spent

[8] *The methodology for calculating these benefits are provided in the economic analysis annex tables and were obtained directly from the DOTC - Project Implementation Program document.*

by fishing vessels in berthing, and savings due to shorter turn-around time of fishing boats

- **Increase in the volume of exports of fishery products** because the availability of storage and processing facilities will improve the quality and shelf life of fish catch from the area; and
- **Land creation and land improvement,** which will result in higher land values for areas contiguous to the port complex. This is incidental to the fact that the complex itself will become a highly developed industrial estate whose market value will have a multiplier effect on land values in surrounding areas.

B. Economic cost of project inputs

The project has several categories of inputs: tradable, non-tradable, composite, and labor. Labor itself is divided into three kinds: domestic skilled, domestic unskilled, and foreign/expatriate for the consultancy services. The economic price for each type of input mentioned here is calculated separately.

- Imported inputs like equipment and cement for the civil and building works are adjusted for the foreign exchange premium on their tradable component and the tariffs and VAT collected by government on their CIF price. Adjustment is also made on the tradable components of the handling and transportation costs of importing these items. Overall, the magnitude of the economic price relative to the financial price depends on the combined upward effects of the foreign exchange premium on the tradable components of these inputs and the downward effects of the tariff, VAT, and commodity-specific distortions on the handling and transport components.
- Local inputs like land, aggregates, and lumber are adjusted for the VAT on their financial values. The expected conversion factor is generally less than one because the economic value of the VAT is zero.
- Local skilled and unskilled laborers are subject to payment of personal income taxes in both their pre-project employment alternative and in the project. Since the project pays wages above the market level, there is a gain

to government in terms of a higher tax base but there is also a loss in terms of taxes lost in the previous employment of the laborers. The economic opportunity cost of labor accounts for the tax distortions and since the tax rate for skilled labor is higher than for the unskilled group, the conversion factor for the former is lower.

- Expatriate labor is assumed to pay a withholding tax on income earned and VAT on the consumption of local goods. The portion of income that is repatriated to the home country entails a foreign exchange premium. All these lead to a conversion factor that is less than one because the economic wage adjusted for these distortions is less than the financial wage paid by the project.
- The conversion factor for a composite input like civil works is calculated as a weighted average of the conversion factors of its component items. The weights are the cost proportions of each item in the composite to the total cost.

Conversion factors for working capital, salvage value: The conversion factor for accounts receivables follows that of sales revenues. For accounts payables, the conversion factor is taken as a weighted average of the conversion factors for water, electricity, and materials. For cash balances, the conversion factor is a weighted average based on all items in recurrent costs. Salvage value has a conversion factor equal to that of the port's functional facilities.

A summary of all the conversion factors used in the construction of the economic resource flow is shown in Table 5.

D. Present Value of Net Economic Benefits

The project's economic NPV, evaluated at a 10.3% economic discount rate, is ₱ 1,387 Million. When compared to the financial NPV of negative ₱ 284.66 Million, evaluated at 10.3%, the net economic benefits are almost seven-fold. Clearly, the

city of Cadiz and the Philippine economy stand to gain from the development of the fishing port complex.

TABLE 5: CONVERSION FACTORS FOR PROJECT ITEMS

Project Item	CF
Total revenues from port operations	0.989
Change in accounts receivable	0.989
Salvage value	0.953
Preparatory works (skilled & unskilled labor)	0.922
Land acquisition	0.936
Civil and building works & basic port facilities	0.953
- Equipment	1.030
- Automotive fuel	0.903
- Cement	0.903
- Reinforcing steel	0.974
- Plumbing material	0.944
- Aggregates	0.945
- Lumber	0.972
- Skilled labor	0.865
- Unskilled labor	0.947
Port functional facilities	0.857
Consultancy services	0.864
Recurrent costs	
- Electricity	1.041
- Water	1.041
- Materials	0.982
- Manpower	0.865
- Other administrative	1.00
Income tax and VAT	0.00
Change in accounts payable	1.021
Change in cash balances	1.027

Part 3: Distributive or Stakeholder Analysis

A. Deriving the statement of externalities

The statement of externalities is built up using the economic resource flow and the real financial cash flow from the total investment point-of-view :

Economic resource flow – Financial cash flow = Statement of externalities

The NPV of the net externalities (inflows – outflows) is then determined using the economic opportunity cost of capital (10.3%) as the discount rate. This can be done in two ways: first, take the NPV of each of the line items in the statement and subtract the summation of the outflows from inflows; or second, take the NPV of the net flow line. Doing both is an effective way of checking whether the statement of externalities is correctly defined.

The project generates overall net positive externalities to the economy amounting to ₱ 1,623 Million. (See Table 6) This is logical following the result that the economic NPV is almost seven times greater than the financial NPV. These externalities are distributed among the stakeholder groups affected by the project, namely: the government, laborers/workers, fish consumers, landowners, fishermen, and fish traders. Reconciling the results of the financial, economic, and distributive analyses, it is clear that the project is able to generate sufficient externalities that more than make up for the its negative financial outcome:

(NPV Financial + NPV Externalities) @ EOCK = NPV Economic @ EOCK

-33.54 + 1,623.40 = 1,389.86

TABLE 6: PRESENT VALUE OF EXTERNALITIES

(In Million Pesos)

Cash Flow Item	Present Value
Economic benefits	
Total Revenues	6.78
Change in Accounts Receivables	0.05
Salvage Value	-1.2
Direct economic benefits from:	
- Port facilities effect	153.58
- Higher fish quality due to sufficient supply of ice	332.30
- Preservation of freshness of unsold fish	503.05
- Increase of supply of fresh fish to urban areas	100.14
- Time Saving Benefits	29.00
- Increase in fishery exports	22.49
- Land creation and land improvement	254.39
Total benefits	**1,387.03**
Economic costs	
Investments	
Land Acquisition /RoW	-0.13
Preparatory Works	-1.97
Civil & building works, & basic port facilities	-20.41
Port functional facilities	-14.38
Consultancy Services	-6.75
Operating Expenses	
a) Electrical Cost	1.04
b) Water Cost	0.15
c) Material cost	-0.02
d) Manpower Expenses	-1.66
e) Other administrative cost	0.00
Income tax	-132.58
Value added taxes	-59.66
Change in Accounts Payables	-0.01
Change in Cash Balance	0.01
Total costs	**-236.37**
Net economic benefits	**1,623.40**

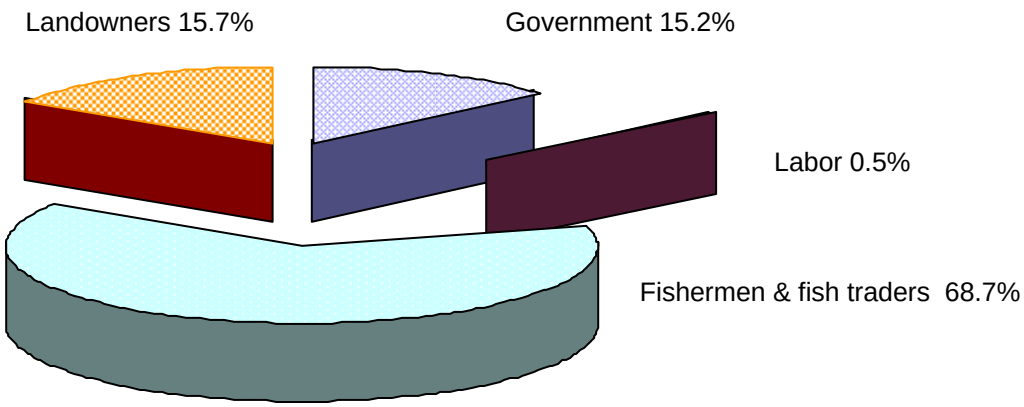
2. *Allocating the Externalities*

The allocation of externalities and identification of their recipients depend on where the adjustments or distortions are coming from in the calculation of the economic price. There are three general rules that are applied:

- Whenever taxes or tariffs are paid in the consumption of an item, the externalities are assigned to government.
- If the project is paying more than the market price to a factor of production, say labor, externalities are assigned to the suppliers of the input – here, the workers – because the extra wage translates to producer surplus for them. If labor pays taxes, then the externalities are divided among labor and government.
- Externalities arising from foreign exchange premium on imported inputs or exported outputs are also assigned to government.

The allocation of externalities that result from improvement in the quality of fish catch, the availability of supply to urban users, the increase in exports, the time savings, and the improvement in land values are more simple to assign as they are targeted to specific beneficiaries. Figure 2 shows a distribution of the project's externalities and other direct economic benefits.

FIGURE 2: DISTRIBUTION OF EXTERNALITIES



The fishermen and fish traders receive most of the externalities of the project because they are able to capture the gain in revenues from improved quality and marketability of their catch when they use the port facilities. Even though they pay value-added taxes in using the port facilities, these are more than offset by the gains in revenues. Labor receives the least amount of net benefits even as the project pays above market wage because of the personal taxes that are paid.

In this analysis, government is considered a separate entity from the proponents (DOTC and PFDA/DA), even though it provides the budgetary appropriations for these agencies. The involvement of government in the project consists of three parts: (1) it collects incremental tariffs, value added taxes, and personal income taxes; (2) it receives net foreign exchange premium from incremental exports of fishery products and the importation of inputs for the project; and (3) it indirectly provides subsidy to the project's consumption of electricity and water through the subsidy it provides for power generation in the country.

5. Risk Analysis

The cash flow projections in the deterministic financial analysis of the project assume that the various project parameters are well-known over time. It is possible, however, that uncertainty and random fluctuations may cause changes in the values of these parameters. When these changes arise, the risk exposure of the project is increased, which may adversely affect its financial and economic outcomes.

Risk analysis conducted using Monte Carlo simulation allows a closer look into the viability of the project by approximating the dynamics and uncertainties of the real world. In the sensitivity analysis of the project, its net cash flows were tested for responsiveness to one-time changes in the values of certain project variables. In risk analysis, the project's financial and economic outcomes (NPVs) are tested for variability to changes in those variables that are expected to have the most

significant impacts. The following variables were selected as risk variables based on the results of the sensitivity analysis:

TABLE 8: RISK VARIABLES AND THEIR IMPACT AND RISK SIGNIFICANCE

Risk Variable	Impact and Risk Significance
Domestic Inflation	Inflation affects the financing requirement of the project through its impact on working capital and interest expenses. If not properly anticipated, it may result in a difficult cash position for the project.
Investment Cost Overruns	An unanticipated increase in the real cost of investments may have a sustained effect on the project's cash flow. Overruns are also possible when the project's implementation schedule is not followed on time or when procurement procedures for capital items are not efficiently followed.
Change in demand for port services & facilties	An unexpected change in the demand level for the port's services and facilities is a major determinant of the port's ability to generate revenues for its operations. Changes in total port revenues is used as a proxy for capturing changes in demand based on the assumption that port fees stay constant.

** ***There are 42 risk variables in the project:***

- *23 domestic inflation risk variables –from year 0 to year 23;*
- *18 change in demand risk variables – from year 3 to year 20; and*
- *1 cost overrun risk variable.*

Monte Carlo simulation requires that probability distributions are first defined for each of the chosen risk variables of the project. The probability distributions are either characterized as normal or custom/step. For domestic inflation and change in demand, which are perceived to have normal distributions, there are two indicators: a mean value that approximates their base values in the deterministic case) and standard deviations that are based on a best estimate of the likely spread of the minimum and maximum values that the risk variables may take. For investment cost overrun, which is perceived to have a custom/step distribution, a range of continuous values with corresponding probabilities is

defined. The mean of this distribution (i.e., summation of the midpoints multiplied by the probabilities) approximates the expected value of the variable in a risky scenario.

A more accurate definition of the probability distribution of a variable like the inflation rate can be obtained by taking the mean and standard deviation of time series data. For investment cost overrun, definition of the step ranges may be: (a) guided by a project analyst's experience of post-implementation cost deviations in other infrastructure projects; or (b) approached as a way of testing the limits of the project's viability, that is, by assuming high probabilities for high cost overrun ranges. The same principle may also be used in setting up the probability distribution of change in demand. The assumed probability distributions of the three risk variables in the project are described in Table 9 below:

Three project outcomes are defined as the risk analysis forecasts. These are the:

- Financial NPV of the project evaluated at EOCK
- Economic NPV of the project evaluated at EOCK; and
- NPV of project externalities evaluated at EOCK.

Monte Carlo simulation uses the probability distributions of the risk variables to simulate changes in the project's risk environment repeatedly and calculates at each instance the value of the three model forecasts. The results of 10,000 trials are then summarized into probability distributions for each of the three forecasts. Table 10 shows the results of the Monte Carlo simulation.

TABLE 9: PROBABILITY DISTRIBUTIONS FOR RISK ANALYSIS

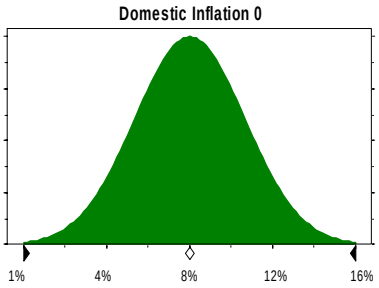
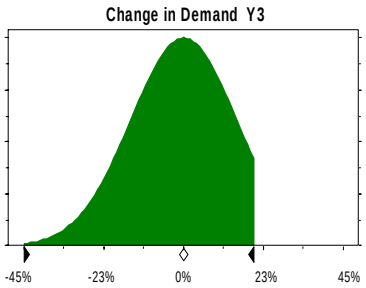
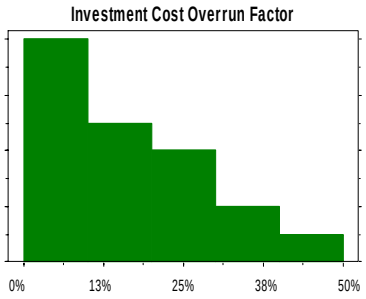
VARIABLE	DISTRIBUTION	RANGE
Domestic Inflation (Number : 23)	Normal 	Mean: 8% Standard Deviation: 2.5%
Change in total port revenues (Number: 18)	Normal (Truncated @ +20%) 	Mean: 0% Standard Deviation: 15%
Investment cost overrun factor (Number: 1)	Custom/ Step 	Range Probability 0% to 10% 0.40 10% to 20% 0.25 20% to 30% 0.20 30% to 40% 0.10 40% to 50% 0.05

TABLE 10: RESULTS OF RISK ANALYSIS

Statistic	Financial NPV	Economic NPV	Externalities NPV
Deterministic/Base Value	-233.54	1,389.86	1,623.40
Expected Value (Mean)	-330.76	1,285.42	1,616.18
Standard Deviation	69.60	69.93	9.54
Probability of NPV<0	100%	0%	0%
Mean standard error	0.70	0.70	0.10

The expected values of the three NPV outcomes are not very different from their values in the deterministic case. They confirm what we already know in the financial, economic, and distributive analysis. The riskiness of the project is shown by the standard deviation. As a measure of dispersion, it denotes the average distance of the simulated values from the mean value of the forecast. For this project, the financial and economic NPVs have almost the same levels of risk. The main difference is that these risk levels have divergent impacts. The certainty of a negative financial NPV is 100% while the probability of the economic NPV becoming negative is nil. This is an important counterpoint for the project because it means that the project will always be able to generate positive externalities that will make it economically viable and socially acceptable. This is also confirmed by the result that there is a 0% probability of getting a negative NPV on the externalities and a standard deviation of only 9.88. These results, however, do not imply that the project will never fail. The analysis is based on the assumption that the project has the appropriate institutional mechanism and organizational structure that will ensure that operations are managed efficiently. Figure 3 shows the cumulative distribution of the three forecast NPVs for the project. The expected values of each forecast are indicated by the mean lines and the probability of a negative NPV is read off the y-axis.

FIGURE 3: CUMULATIVE DISTRIBUTION OF PROJECT NPVs

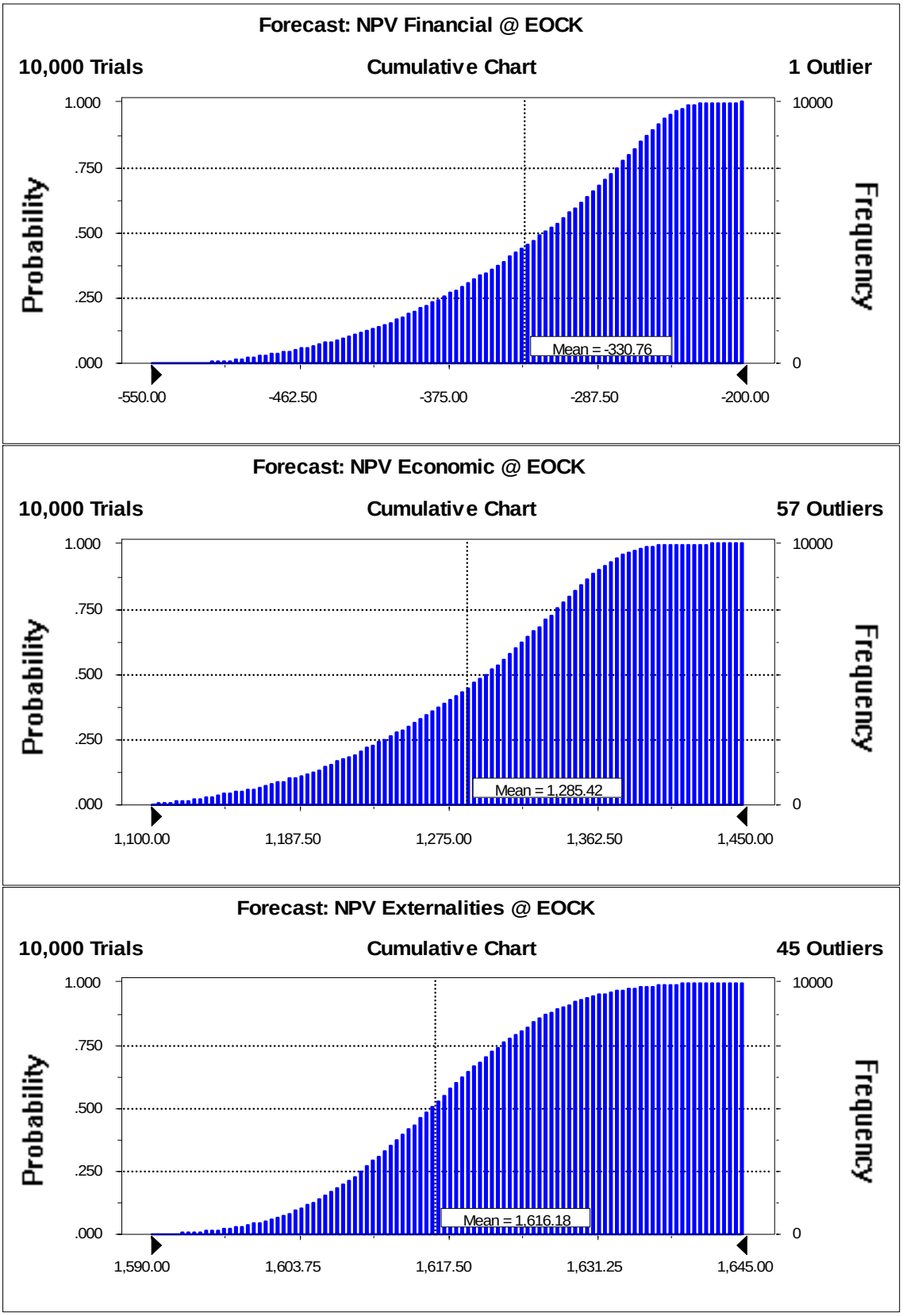


TABLE 11: FACTORS AFFECTING THE VOLATILITY IN NPV

(Measured by their % contribution to variance of NPV.)

Source of Risk	Financial NPV	Economic NPV	Externalities NPV
Investment Cost Overrun factor	96.0	91.5	
Domestic Inflation Y10	0.1		2.9
Domestic Inflation Y11			3.9
Domestic Inflation Y12	0.3		3.0
Change in demand Y3	0.3	1.2	14.3
Change in demand Y4	0.4	1.3	12.3
Change in demand Y5	0.4	1.1	9.2
Change in demand Y6	0.2	0.6	8.1
Change in demand Y7	0.2	0.6	6.3
Change in demand Y8	0.2	0.6	5.1
Change in demand Y9		0.4	5.8
Change in demand Y13	0.2	0.4	
Change in demand Y14	0.2	0.4	
Total*	98.5	98.1	70.9

Only the top 10 variables are shown so the total does not add up to 100%.

The risk analysis confirms the findings from sensitivity analysis that the demand factor will have a significant impact on the riskiness of the project.[9] Over 61% of the variability in the value of the externalities are due to the volatility in the expected change in demand. To effectively attain its revenue targets every year, the PFDA must ensure that clients' interests and concerns are regularly addressed. Maintaining sustained patronage by its customers is critical for PFDA considering that without effective demand the availability of the port's services/facilities alone will not translate into realized benefits for the economy.

[9] *Recall that in the sensitivity analysis, this factor was tested as a change in the occupancy rate of land spaces and as a change in total revenues separately. To simplify the analysis, the demand factor for the port's 18 different services/facilities was consolidated as a single "change in demand" variable for risk analysis. A more accurate modeling of demand as a risk variable would be to do it indvidually for each type of port service/facility.*

The investment cost overrun factor is more significant as source of risk in the case of the financial and economic outcomes. Over 91% of the variability in the financial and economic NPVs are attributed to fluctuations in changes of investment cost. In the sensitivity analysis, a tentative observation was made that investment cost overrun is a strong possible source of risk because of its impact on the net cash flows. In risk analysis, it is the NPV that is being evaluated for variability and we know that investment costs carry a substantive weight in determining the project's viability, so the effect is more discernible.

Domestic inflation does not appear to be a significant source of variability in both the financial and economic outcomes of the project. While this is not a wrong result, it is not totally expected given that the net cash flows were observed to be responsive to it in the sensitivity analysis. This should not however, be misinterpreted as a reason for ignoring the role of inflation in the project's long-term viability. What this means is that we have sufficiently accounted for inflation in the deterministic modeling of the project.

IV. CONCLUSION

The integrated analysis of the proposed Cadiz Fishing Port project shows that it is not financially attractive but it is economically viable. As a private sector endeavor, it may not pass tests for financial viability but as a public sector project, it passes the test for net creation of welfare. Not only does the project generate a significant amount of externalities for the economy, it is also able to provide the largest amount of net benefits to the priority targeted beneficiaries, i.e., the fishermen and fish traders.

The project is also socially attractive in the sense that its gains are spread to other sectors in the economy, namely labor, landowners, and government. The benefits to government are likely to have local multiplier effects as the city's tax revenue allocation gets ploughed back into local development projects. An incidental benefit, increase in the value of land contiguous to the port, may be deemed as a socially unacceptable result if it is not consistent with income redistribution goals. This may be a politically contentious impact of the project if the recipient-landowners are not small landholders. PFDA needs to manage this potential equity issue by ensuring that a communication program for the project explains why this effect is necessary and can still potentially redound to benefits for the city.