

**Worked Example of the Use of the
General Theory to Rate the ex-Ante
Impact Potential of Assets
(Extension of Section 7)**

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PRICING IMPACT

Extending impact investing to price externalities and lower the cost of capital to impactful investments

David Wilton

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Section 7 of “Pricing Impact” does not provide a fully worked example of an impact rating system based on the General Theory developed in the note.

This was a deliberate choice as, with the data presently available, any rating system developed on the General Theory will not be sufficiently robust to use and I did not want to publish something which might be used without further improvement.

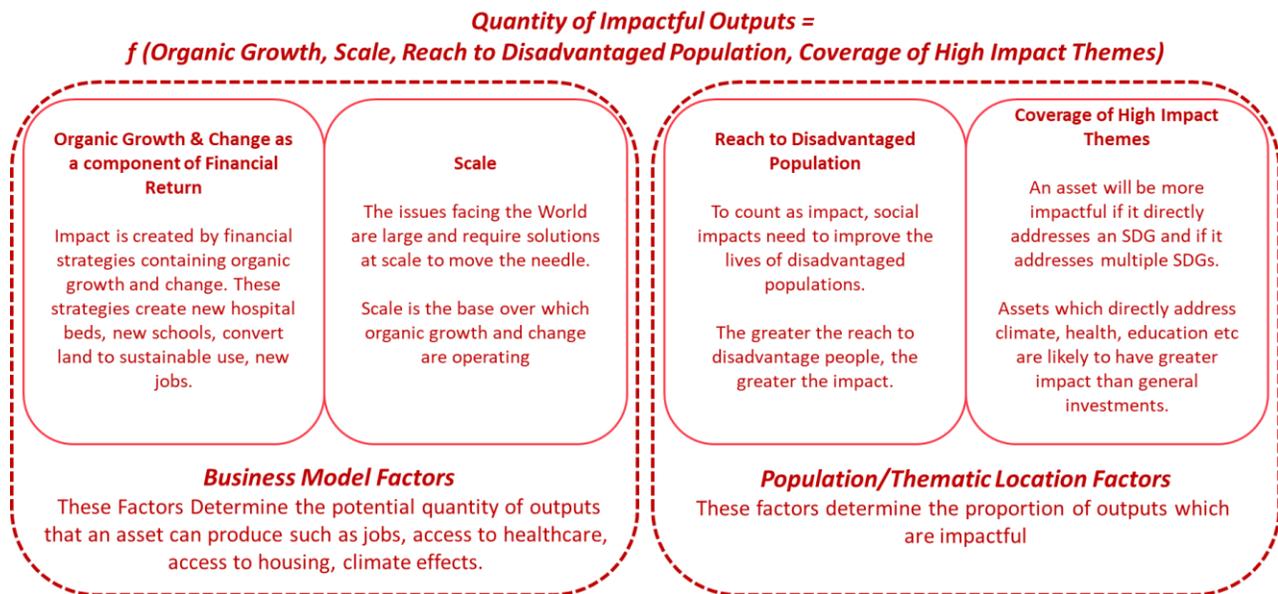
This however has not been a popular choice and I have had many responses indicating that an example is needed to provide a starting place for people to develop their own thinking around operationalizing the General Theory to use in portfolio management.

In response I have created the worked example which follows, in which I point out where there are gaps and areas needing further development and to which I add this health warning: this is an example only, more work is needed in both the areas I point out and in others of which I am not aware before this impact rating method will be robust enough to use.

Framing the Exercise

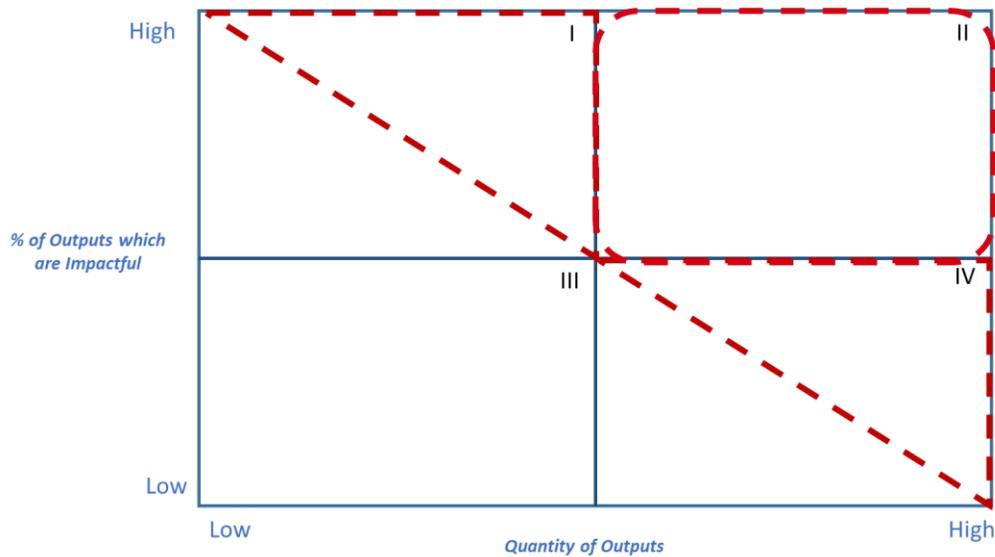
The objective of this exercise is to use the General Theory developed in “Pricing Impact”, illustrated in Chart 1, to create a methodology for the ex-ante rating of the potential of both (i) classes of assets and (ii) individual assets, to create a quantity of impactful outputs.

Chart 1 The Determinants of an Asset’s Ability to Create a Quantity of Impact



To achieve this objective we create an Impact Quantity Rating Matrix which uses Chart 2 as a framework (refer to Charts 25 and 26 pp 73, 74 of “Pricing Impact”). The idea is to map assets of all types into Chart 2 to create a family of ratings in which the potential of each asset to create a quantity of impactful outputs is rated on a consistent basis and the ratings of assets relative to each other are objectively reasonable and consistent with the logic of the General Theory. Imagine Chart 2 filled with a grid of numbers, each of which is the impact quantity rating of assets with particular characteristics.

Chart 2 A Matrix Framework for Rating the Quantity of Impactful Outputs



In Chart 2 each axis is a composite measure of two variables, which means that the placement of assets within the Chart needs some explanation.

The x-axis measures the quantity of outputs such as jobs, access to education and carbon offset that an asset can potentially produce. It says nothing about the percentage of these outputs which are impactful, it is simply a measure of the potential quantity of outputs. Two factors drive the quantity measure: the contribution of organic growth to return and the scale of the base over which organic growth is occurring.

To be positioned in the right side of the chart in segments II and IV, *both* the contribution of organic growth and scale have to be moderate to high.

An asset can be on the left hand side of the chart due to both organic growth and scale being low, or due to one being very low while the other is moderate or high. This leads to quite different types of assets being located on the left side of Chart 2 in segments I and III. For example, a very large company with big scale but no organic growth and a quite small company with high organic growth but little scale will both be on the left side of the chart.

The y-axis measures the percentage of the output which is in fact impactful.

For environmental impact this is a single measure of the extent to which the asset is focused on creating positive environmental outputs.

For social impact it is a compound measure of (i) the extent to which the asset is focused on an impactful theme such as education or healthcare and (ii) the extent to which the beneficiaries (consumers or employees) are from a disadvantaged population. This combined measure means that for assets with social impact to be located in the top of the chart in segments I and II, exposure to both an impactful theme and a disadvantaged population needs to be moderate to high.

Assets may be in the bottom half of the chart in segments III and IV for quite different reasons. Either exposure to both impact themes and the disadvantaged is low, or the exposure to one may be high and

the other very low. This results in activities with high exposure to impactful themes but very low benefit to the disadvantaged being located in the bottom half of Chart 2.

In Chart 2, assets with above-average impact characteristics are located above the diagonal dashed line. For these assets a greater percentage of outputs are impactful for any given quantity of output.

The assets likely to create the greatest quantity of impactful outputs in Chart 2 are those located in Segment II. These assets combine the largest quantity of outputs with the largest percentage of outputs which are in fact impactful.

Developing Ratings Step 1: Creating the x-Axis measure of Quantity of Output

The x-axis requires a compound measure of (i) the contribution of organic growth to financial returns and (ii) scale.

As an initial approximation of this we can use data from Tables 1 and 2 below (corresponding to Tables 2 and 3 pp44-45 in “Pricing Impact”).

Table 1 Revenue Growth and Job Creation

	SME	Larger Company	Total/Average
Number of companies	235	284	519
Total jobs created	26,679	276,656	303,335
Average jobs created per company	114	974	584
Average revenue growth per company	\$14,112,910	\$140,863,906	\$81,644,178
Average revenue growth per job created	\$120,694	\$132,294	\$131,208
Investment by funds	\$946,000,000	\$3,320,000,000	\$4,266,000,000
Fund investment per job created	\$35,439	\$12,000	\$14,064
Job growth rate (annual)	18.3%	12.9%	15.3%
Revenue growth rate (annual)	29.8%	14.9%	21.5%
Average number of jobs at investment	79	1,628	927
Average revenue at investment	\$4,130,336	\$231,354,368	\$125,616,452

Table 2 Growth Rate in Revenue at Different Company Sizes

	Revenue Growth Rate
All companies	21.5%
Revenue at investment < \$5 million	36.2%
\$5 to \$15 million	18.8%
\$15 to \$30 million	19.2%
\$30 to \$50 million	7.9%
\$50 to \$100 million	14.8%
\$100 to \$250 million	13.2%
\$250 to \$500 million	6.0%
> \$500 million	4.4%

Table 1 has data on revenue growth and job creation from IFCs funds’ portfolio. From this data we can use the number of jobs created as a proxy for the potential quantity of outputs an asset can create. Using jobs as a proxy is reasonable as other outputs such as access to education or healthcare are more directly related to revenue growth than jobs, as each new student or patient adds directly to revenue.

In Table 1 the average revenue growth per job created is quite similar for both SMEs and larger companies. Let’s take a rough average of \$125,000 increase in revenue per job created.

Turning to Table 2, which is from the same data set as Table 1, we can smooth this data series and then apply the annual growth rates to company revenue over an assumed holding period to get an estimate of total revenue growth, which we then divide by \$125,000 to get an estimate of the number of jobs created over the holding period. For this exercise we assume a five year holding period.

Table 3 shows the calculations used and the results. As the revenue growth data in Table 2 only extends to companies with \$500-1000m of initial revenue, simple linear smoothing was used to estimate revenue growth at larger company sizes. This data gap at larger company sizes is an area that requires research.

Table 3 Estimate of Jobs Created Over a Five Year Period

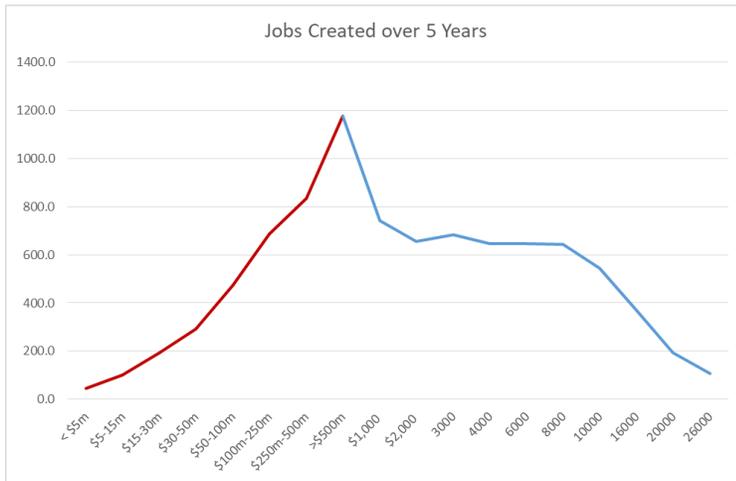
\$ Revenue at entry	Average revenue CAGR	Average Revenue CAGR Smoothed	Total Revenue Growth over 5 years, starting at mid point					Total Revenue Growth \$m	Average Total Jobs Created over 5 years
			1	2	3	4	5		
< \$5m	36.20%	36.20%	3.4	4.6	6.3	7.6	9.1	5.7	45.5
\$5-15m	18.80%	20.00%	12.0	14.4	17.3	20.6	24.5	12.5	99.8
\$15-30m	19.20%	19.00%	26.8	31.9	37.3	43.6	51.0	24.3	194.0
\$30-50m	7.90%	17.00%	46.8	54.8	63.0	72.4	83.3	36.5	291.8
\$50-100m	14.80%	15.00%	86.3	99.2	114.1	128.9	145.7	59.4	475.2
\$100-250m	13.20%	13.00%	197.8	223.5	252.5	267.7	283.7	86.0	687.7
\$250-500m	6%	6%	397.5	421.4	446.6	473.4	501.8	104.3	834.7
\$500-1000m	4.40%	4.40%	783.0	817.5	853.4	891.0	930.2	147.2	1177.4
\$1000-2000m		2.20%	1022	1044.5	1067.5	1090.9	1114.9	92.9	743.6
\$2000-3000m		1.00%	2020	2040.2	2060.6	2081.2	2102.0	82.0	656.2
\$3000-4000m		0.70%	3021	3042.1	3063.4	3084.9	3106.5	85.5	683.8
\$4000m		0.50%	4020	4040.1	4060.3	4080.6	4101.0	81.0	648.0
\$6000m		0.33%	6020	6040.1	6060.2	6080.4	6100.7	80.7	645.4
\$8000m		0.25%	8020	8040.1	8060.2	8080.3	8100.5	80.5	644.0
\$10000m		0.17%	10017	10034.0	10051.1	10068.2	10085.3	68.3	546.3
\$16000m		0.07%	16,011.5	16,023.0	16,034.4	16,045.9	16,057.5	46.0	367.9
\$20000m		0.03%	20,006.1	20,012.1	20,018.2	20,024.2	20,030.3	24.2	193.8
\$26000m		0.01%	26,003.3	26,006.6	26,010.0	26,013.3	26,016.6	13.3	106.2

Chart 3 graphs the estimate of the number of jobs created over five years. Chart 3 shows a pattern of jobs initially increasing with company size as the increased scale off-sets a declining rate of growth in revenue. However, around initial revenue of \$1000m the decline in the rate of growth begins to off-set the increasing scale and the number of jobs created begins to decline.

Chart 3 suggests that companies with between \$100m and \$1000m of initial revenue have the greatest potential to create outputs such as jobs and access to things which improve people’s lives.

However, larger companies can also potentially create large numbers of outputs and so are an important part of the investment opportunity space.

Chart 3 Estimated Jobs Created Over a Five Year Period



To create a measure for the x-axis on Chart 2 we calculate the quantity of jobs created at each level of revenue as a percentage of the maximum. This gives us the numbers in Table 4 which we use on the x-axis to indicate the Quantity of Output.

Table 4 x-Axis Measure of Quantity of Output

Revenue at Entry	Jobs Created as a % of Maximum
\$500-1000m	100%
\$250-500m	71%
\$1000-2000m	63%
\$100-250m	58%
\$3000-4000m	58%
\$2000-3000m	56%
\$4,000	55%
\$6,000	55%
\$8,000	55%
\$10,000	46%
\$50-100m	40%
\$16,000	31%
\$30-50m	25%
\$15-30m	16%
\$20,000	16%
\$26,000	9%
\$5-15m	8%
< \$5m	4%

Developing Ratings Step 2: Creating the y-Axis measure of the Percentage of Output Which is Impactful

The y-axis is a compound measure of exposure to (i) high impact themes such as the environment, health care and education and (ii) for social impacts (but not environmental impact), exposure to a disadvantaged population.

Table 5 creates a simple compound measure of “percentage impactful” by multiplying the two exposure percentages.

Table 5 Compound Measure of Exposure to High Impact Themes and Disadvantaged Populations

Exposure to High Impact Theme	100%	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	
	90%	0%	9%	18%	27%	36%	45%	54%	63%	72%	81%	90%	
	80%	0%	8%	16%	24%	32%	40%	48%	56%	64%	72%	80%	
	70%	0%	7%	14%	21%	28%	35%	42%	49%	56%	63%	70%	
	60%	0%	6%	12%	18%	24%	30%	36%	42%	48%	54%	60%	
	50%	0%	5%	10%	15%	20%	25%	30%	35%	40%	45%	50%	
	40%	0%	4%	8%	12%	16%	20%	24%	28%	32%	36%	40%	
	30%	0%	3%	6%	9%	12%	15%	18%	21%	24%	27%	30%	
	20%	0%	2%	4%	6%	8%	10%	12%	14%	16%	18%	20%	
	10%	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	
	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
			0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
		Exposure to Disadvantaged Population											

To get from Table 5 to units we can use on the y-axis we need to take each of the 121 “percentage impactful” measures in Table 5, label them with a descriptor and sequence them from largest to smallest.

Table 6 (page 9) places the measure of “percentage impactful” from Table 5 on the y-axis and the measure of “quantity of output” from Table 4 on the x-axis. The matrix is then filled in with the multiples of the corresponding values on each axis, creating Impact Quantity Ratings which provide a consistent ranking of the potential to create a quantity of impactful outputs of assets with multiple combinations of “percentage impactful” and “quantity of output”.

There are three types of asset which require further work to fit into the ranking matrix, either because their creation of outputs is not based on organic growth or because they create jobs through a high exposure to the disadvantaged but no additional social impacts due to lack of exposure to high impact themes.

- Projects focused on *new construction* (for example green buildings) or *conversion* of existing assets to green or impactful use (for example conversion of land to sustainable use). The financial return on these types of activity does not come from revenue growth. Rather, the financial value created comes from the change in value of the asset upon completion or conversion. As these types of activity are concentrated in climate (green construction, conversion to green use) or a high impact social theme combined with a high exposure to a disadvantaged population (new build low income housing) they are likely to be located in the top part of the Table 6 matrix indicated by the red border. The quantity can possibly be measured by the value of the final asset, upon completion of construction or conversion. Work needs to be done in this area to calibrate this measure with the revenue-based measure used in the rest of the chart.
- Assets which *support an existing stock* of a high impact asset but which have little or no growth and so are not adding to the inventory of impactful assets required to meet the SDGs. Supporting these assets is worthwhile. However, as these assets have low-to-zero organic

growth the General Theory-based methodology will give them a low-to-zero score. Work is needed to determine where in the rating matrix to place these stocks of existing but not growing impactful assets. My initial thought is that they belong in the upper left of the matrix, where they will get an output score of no more than half that of a correspondingly scaled asset with growth, but will be given full recognition of their high exposure to High Impact Themes and Disadvantaged Populations. This area of the ranking matrix is indicated by the dashed orange border in Table 6.

- Assets which have a positive impact on a Disadvantaged Population (DP) without any exposure to High Impact Themes (HIT). These are the type of generalist growth assets which create jobs for lower income populations and so contribute to SDGs 1 (no Poverty), 8 (decent work and economic growth) and 10 (reduced inequalities), without the double-benefit of also bringing benefits such as improved education or healthcare. Work is needed to determine where to place these assets in the matrix. My initial thought is that the 'percentage impactful' rating of an asset (HIT x DP) should not be less than half its exposure to a Disadvantaged Population. So if $(HIT \times DP) > 50\% \text{ of DP}$, the rating is $(HIT \times DP)$. If $(HIT \times DP) < 50\% \text{ of DP}$, the rating is 50% of DP. For social impact this gives greater weight to exposure to Disadvantaged Populations than to High Impact Themes by providing a downside limit on ratings.

Table 6 follows on the full page below.

Note that environmentally impactful assets do not require the double measure of (HIT x DP) and are rated in Table 6 on their exposure to HIT alone.

Developing Ratings Step 3: Interpretation of the Rating Matrix

General Theories speak to the general characteristics of things. It follows that the rating matrix in Table 6 describes the general characteristics of assets without any description of the assets themselves. Table 6 does not speak to us using the financial asset descriptors that we are used to: growth equity, real estate, debt and so on. It also does not speak to us using the impact descriptors we are used to except in a very stylized way.

This potentially creates a bit of a cognitive barrier.

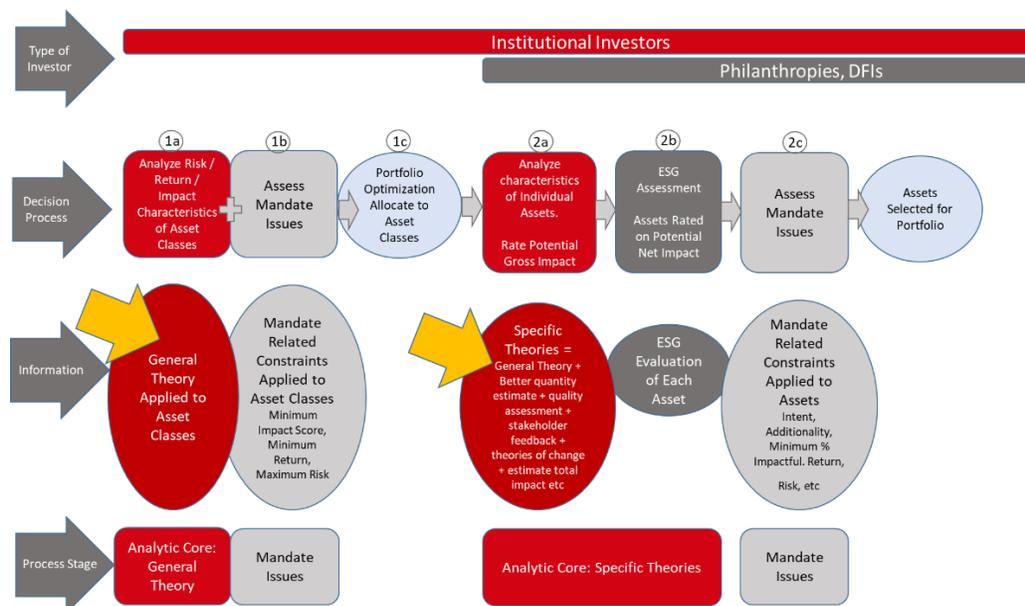
To overcome this barrier and integrate Table 6 into a reference framework with which we are more familiar, we need to undertake an exercise of rating the impact quantity of assets of different types and seeing where they are located within the matrix.

Once we have done this, we can view the relative placement of the assets and get a better feel for the logic of the methodology and the consistency of the ratings.

As a reminder, the General Theory specifically excludes mandate factors such as intent, additionality and requirements for the minimum ‘impactfulness’ of an asset as these factors help to ensure that individual investors make investments which are consistent with their mandates, but do not help to predict the quantity of impactful outputs. Likewise, the General Theory specifically excludes ESG and assessment of the quality of impact as these factors, while relevant to the impact of individual assets, cannot be generalized to asset classes.

The orange arrows Chart 4 (corresponds to Chart 23 page 63 in ‘Pricing Impact’) indicate the parts of the portfolio construction process we are dealing with here.

Chart 4 Constructing a Mission-Compliant Portfolio



When observing where assets are located in the impact quantity rating matrix it is important to keep in mind the distinction between (i) estimating the potential quantity of impactful outputs, (ii) application of mandate factors and (iii) a deeper assessment of the impact characteristics of individual assets, including ESG and quality of impact outputs, as some of the results from the rating matrix are likely to be completely non-intuitive, even outrageous at first glance, if we fail to maintain a mental separation between these three distinct steps in assessing an assets characteristics and its suitability for inclusion in a given mandate.

We will begin by rating different types of private equity to enable us to understand the distinctions made by the rating matrix. Seven types of private equity fund are rated in Table 7 and mapped onto the rating matrix in Table 11 (page 15).

Table 7 Rating of Various Types of Private Equity Funds

Type of Fund	HIT %	DP%	Revenue Bracket (Organic Growth +Scale)	Matrix rating	Comments
Environmental Growth Equity	100%	N/A	\$250-500m	70.9%	Strong HIT exposure (environment) in strong growth revenue bracket.
Healthcare Growth Equity	100%	90%	\$100-250m	52.6%	Strong all round, leading to a strong rating.
Generalist Emerging Market Growth Equity, no HIT exposure	0%	100%	>\$500m	50%	Good rating, even though no HIT exposure, due to strong DP exposure and strong growth revenue bracket.
Healthcare, Buyout Fund Developed Market. Less growth, more structuring	100%	40%	\$8000m	21.9%	Good rating due to high HIT exposure, moderate DP exposure and good scale.
Education Growth Equity, Located in difficult areas, smaller companies with less scalability	100%	100%	\$5-15m	8.5%	Low rating despite top HIT and DP exposures due to small scale resulting in smaller number of outputs.
Healthcare, Growth Equity, focused on wealthier part of population	100%	10%	\$250-500m	7.1%	Low rating despite top HIT exposure and strong location for scale due to very low DP exposure.
LBO Fund, larger companies	0%	0%	\$20000m	0%	Zero rating due to lack of exposure to HIT and DP. Also very weak scale location due to insignificant organic growth.

Perhaps the two funds in Table 7 whose rating requires the most explanation are the second and third from the bottom of Table 7.

The education growth equity fund would appear to be an almost ideal impact investment with 100% exposure to education in a 100% disadvantaged population. However, the lack of scale leads to its low impact quantity rating. This fund is positioned near the top left of the rating matrix in Segment I. Segment I of the rating matrix is home to assets with strong ‘percentage impactful’ ratings combined with low scale. Many of the assets in Segment I will be the focus of mission-driven investors whose mandate requires intent. The mandate screens of such investors (refer Chart 4) will lead them to prefer assets in Segment I over assets in other Segments with higher ratings.

However, investors without such a mandate, seeking to maximize the quantity of impact outputs subject only to risk and return constraints, will prefer to focus on assets with higher impact quantity ratings.

Rating assets' impact strictly in terms of quantity is consistent with meeting the SDGs. In terms of ability to achieve the quantity of impactful outputs required to move the needle on the SDGs, assets with higher impact quantity ratings will be able to contribute a greater quantity of impactful outputs.

Superficially the Healthcare Growth Equity Fund with a 100% HIT exposure and located in the \$250-500m revenue bracket which has strong scale, would appear to be a strong impact proposition. However, the very low exposure to a Disadvantaged Population at only 10% results in a low rating.

This fund is located in Segment IV of the rating matrix in Table 11. Segment IV is home to assets with strong scale characteristics but weak exposure to High Impact Themes and/or Disadvantaged Populations. Assets located in Segment IV may initially look attractive because of high exposure to high impact social themes and strong scale, only to be undermined by weak reach to the disadvantaged.

A third fund worth commenting on in Table 7 is the generalist fund with 100% DP exposure but no exposure to HIT, located in a revenue bracket with strong scale. This fund is representative of many emerging market funds in that it will be creating jobs for a lower income population, a valuable contribution to SDGs 1 (no poverty), 8 (decent work and economic growth) and 10 (reduced inequalities), without creating additional benefits in high impact themes which contribute to a broader group of SDGs.

Table 8 Various Types of New Construction and Conversion to Impactful Use

Type of Fund	HIT %	DP%	Revenue Bracket (Organic Growth +Scale)	Matrix rating	Comments
New Green Construction at Scale	100%	N/A	Large Value of Completed Construction	58.4%	Good rating due to high environmental exposure at scale.
Existing Green Buildings at Scale	100%	N/A	Large revenue but no growth	31.2%	Rating good but lower than the construction-focused activity above as supporting existing green assets at scale without adding more.
Existing sustainable farmland moderate scale	100%	N/A	Moderate revenue but no growth	25%	Rating good but lower than the portfolio of green buildings above due to lower scale.
New Build low income housing, very small scale	100%	100%	Low Value of Completed Construction	3.9%	Low rating due to very small scale, despite 100% HIT and 100% DP exposure.

In Table 8 the fourth asset, the low income housing, gets a low impact quantity rating due to small scale despite 100% HIT and DP exposures. Like the education growth equity fund in Table 7 this fund is also located in Segment I of the rating matrix.

The General Theory can be applied to listed equity as well as private equity and Table 9 positions different types of listed equity into the rating matrix. The point to note in Table 9 is the large size of many listed companies will place them in revenue brackets in which the contribution of organic growth is very small, which dampens impact quantity ratings considerably.

Table 9 Various Types of Listed Equity

Type of Fund	HIT %	DP%	Revenue Bracket (Organic Growth +Scale)	Matrix rating	Comments
Mid-Size listed Healthcare company, growth phase	100%	40%	\$500-1000m	40%	Good rating due to high HIT exposure and moderate DP exposure in a strongly scalable revenue bracket.
Large established Healthcare company, little growth	100%	30%	\$20,000m	4.9%	Low rating despite high HIT exposure due to low-ish DP exposure and, particularly, location in a revenue bracket with low organic scalability.
Large established general consumer products group	10%	20%	\$20,000m	1.6%	Very low rating due to weak HIT and DP exposure and location in a revenue bracket with low organic scalability.

Table 10 looks at the ratings of various types of debt. Using the General Theory methodology, debt is rated on the same basis as the equity of the company. Thus the debt of the mid-cap growth company gets a good impact quantity rating due to high exposure to both HIT and DP and its location in a revenue bracket with strong organic growth.

How to rate sovereign bonds using the General Theory as a framework requires more consideration.

In Table 10 a rough correspondence is made between the use of government funds and exposure to HIT. Alternatively one could think of basing the HIT exposure on a combination of ratings reflecting countries commitment to transparency, environmental standards and so on. The income distribution of the country's population is used to gauge DP exposure. Scale will depend on population size. To sync country-based with company-based scale measures, the size of populations could be compared to the size of companies' customer bases. Most countries will show as large on such a comparison, I suspect.

Table 10 Various Types of Debt

Type of Fund	HIT %	DP%	Revenue Bracket (Organic Growth +Scale)	Matrix rating	Comments
Debt of Mid-Cap growth company, mostly education focus	90%	80%	\$250-500m	51%	Strong rating due to high HIT and DP exposure and location in a revenue bracket with strong organic scalability.
Sovereign Bond, 50% budget spend on health, ed and other social, 70% Popn DP	50%	70%	Large Scale	35%	Good rating due to combination of moderate HIT exposure and high DP exposure at scale.
Sovereign Bond, 60% budget spend on health, ed and other social, 10% Popn DP	60%	10%	Large Scale	6%	Low rating due to low DP exposure, despite high HIT exposure and scale.

The different assets described in Tables 7 through 10 are shown mapped into the rating matrix in Table 11 (page 15).

The rating matrix achieves a useful and meaningful distinction between different assets of all types.

Assets with strong 'percentage impactful' ratings but weak output quantity ratings are grouped in Segment I.

Assets with strong-to-medium 'percentage impactful' and good output quantity ratings are grouped in Segment II.

Assets with both weak 'percentage impactful' and low output quantity are grouped in Segment II.

Assets with weak 'percentage impactful' but strong output quantity are grouped in Segment IV.

The green shaded area in Table 11 indicates the direction in which investors should search to find assets which will help to bring the impact quantity rating of their portfolios above the average.

	100%	3.9%	8.5%	9.0%	16.5%	15.5%	25.0%	31.2%	40.4%	46.8%	54.7%	54.8%	55.0%	55.7%	58.1%	58.4%	63.2%	70.9%	100.0%
100% exposure to both HIT and DP	100%	3.9%	8.5%	9.0%	16.5%	15.5%	25.0%	31.2%	40.4%	46.8%	54.7%	54.8%	55.0%	55.7%	58.1%	58.4%	63.2%	70.9%	100.0%
100% HT 90% DP / 90% HT 100% DP	90%	3.1%	6.7%	8.1%	14.8%	14.8%	22.3%	28.1%	36.3%	41.8%	49.2%	49.3%	49.5%	50.2%	52.6%	52.6%	56.8%	63.8%	90.0%
90% HT 90% DP	81%	3.1%	6.9%	7.3%	13.3%	13.3%	20.1%	25.3%	32.7%	37.6%	44.3%	44.4%	44.6%	45.1%	47.0%	47.3%	51.2%	57.4%	81.0%
100% HT 80% DP / 80% HT 100% DP	80%	3.1%	6.8%	7.2%	13.2%	13.2%	19.8%	25.0%	33.3%	37.1%	43.8%	43.8%	44.0%	44.6%	46.5%	46.7%	50.5%	56.7%	80.0%
90% HT 80% DP / 80% HT 90% DP	72%	2.8%	6.1%	6.5%	11.9%	11.9%	17.8%	22.5%	29.1%	33.4%	39.4%	39.5%	39.6%	40.1%	42.1%	42.1%	45.5%	51.0%	72.0%
100% HT 70% DP / 70% HT 100% DP	70%	2.7%	5.9%	6.3%	11.5%	11.5%	17.3%	21.9%	28.3%	32.5%	38.4%	38.5%	38.5%	39.0%	40.7%	40.9%	44.2%	49.6%	70.0%
80% HT 70% DP	64%	2.5%	5.4%	5.8%	10.5%	10.5%	15.9%	20.0%	25.8%	29.7%	35.0%	35.1%	35.2%	35.7%	37.4%	37.4%	40.4%	45.4%	64.0%
90% HT 70% DP / 70% HT 90% DP	63%	2.4%	5.3%	5.7%	10.4%	10.4%	15.6%	19.7%	25.4%	29.2%	34.5%	34.5%	34.7%	35.1%	36.6%	36.8%	39.8%	44.7%	63.0%
100% HT 60% DP / 60% HT 100% DP	60%	2.3%	5.1%	5.4%	9.9%	9.9%	14.9%	18.7%	24.2%	27.8%	32.8%	32.9%	33.0%	33.4%	34.8%	35.0%	37.9%	42.5%	60.0%
80% HT 60% DP / 70% HT 90% DP	56%	2.1%	4.7%	5.1%	9.2%	9.2%	13.9%	17.5%	22.6%	26.0%	30.6%	30.7%	30.8%	31.2%	32.5%	32.7%	35.4%	39.7%	56.0%
90% HT 60% DP / 60% HT 90% DP	54%	2.1%	4.6%	4.9%	8.9%	8.9%	13.4%	16.9%	21.8%	25.1%	29.5%	29.6%	29.7%	30.1%	31.5%	31.5%	34.1%	38.3%	54.0%
100% HT 50% DP / 50% HT 100% DP 40% HT 100% DP	50%	1.9%	4.2%	4.5%	8.2%	8.2%	12.4%	15.6%	20.2%	23.2%	27.3%	27.4%	27.5%	27.9%	29.0%	29.2%	31.6%	35.4%	50.0%
70% HT 70% DP	48%	1.9%	4.2%	4.4%	8.1%	8.1%	12.1%	15.3%	19.8%	22.7%	26.8%	26.9%	27.0%	27.3%	28.5%	28.6%	30.3%	34.7%	48.0%
90% HT 50% DP / 50% HT 90% DP 40% HT 90% DP	48%	1.9%	4.1%	4.3%	7.9%	7.9%	11.9%	15.0%	19.4%	22.3%	26.3%	26.3%	26.4%	26.8%	27.9%	28.0%	30.3%	34.0%	48.0%
70% HT 60% DP / 60% HT 90% DP	45%	1.7%	3.8%	4.1%	7.4%	7.4%	11.2%	14.1%	18.2%	20.9%	24.6%	24.7%	24.8%	25.1%	26.1%	26.3%	28.4%	31.9%	45.0%
100% HT 40% DP / 80% HT 50% DP / 50% HT 80% DP 40% HT 80% DP	42%	1.6%	3.6%	3.8%	6.9%	6.9%	10.4%	13.1%	17.0%	19.5%	23.0%	23.0%	23.1%	23.4%	24.5%	24.5%	26.5%	29.8%	42.0%
80% HT 40% DP	40%	1.5%	3.4%	3.6%	6.6%	6.6%	9.9%	12.5%	16.1%	18.6%	21.9%	21.9%	22.0%	22.3%	23.2%	23.4%	25.3%	28.4%	40.0%
70% HT 40% DP	36%	1.4%	3.1%	3.2%	5.9%	5.9%	8.9%	11.2%	14.5%	16.7%	19.7%	19.7%	19.8%	20.1%	20.9%	21.0%	22.7%	25.5%	36.0%
100% HT 30% DP / 60% HT 40% DP	35%	1.4%	3.0%	3.2%	5.8%	5.8%	8.7%	10.9%	14.1%	16.2%	19.1%	19.2%	19.3%	19.5%	20.3%	20.3%	22.1%	24.8%	35.0%
80% HT 30% DP	32%	1.2%	2.7%	2.9%	5.3%	5.3%	7.9%	10.0%	12.9%	14.8%	17.5%	17.5%	17.6%	17.8%	18.6%	18.7%	20.2%	22.7%	32.0%
100% HT 20% DP / 60% HT 30% DP / 50% HT 60% DP	30%	1.2%	2.5%	2.7%	4.9%	4.9%	7.4%	9.4%	12.1%	13.9%	16.4%	16.4%	16.5%	16.7%	17.4%	17.5%	18.9%	21.3%	30.0%
70% HT 20% DP	28%	1.1%	2.4%	2.5%	4.6%	4.6%	6.9%	8.7%	11.3%	13.0%	15.3%	15.3%	15.4%	15.6%	16.3%	16.4%	17.7%	19.8%	28.0%
50% HT 20% DP	27%	1.0%	2.3%	2.4%	4.4%	4.4%	6.7%	8.4%	10.9%	12.5%	14.8%	14.8%	14.9%	15.0%	15.7%	15.8%	17.1%	19.1%	27.0%
100% HT 10% DP / 50% HT 20% DP	25%	1.0%	2.1%	2.3%	4.1%	4.1%	6.2%	7.8%	10.1%	11.8%	13.7%	13.7%	13.8%	13.9%	14.5%	14.6%	15.8%	17.7%	25.0%
80% HT 30% DP 60% HT 40% DP	24%	0.9%	2.0%	2.2%	4.0%	4.0%	5.9%	7.5%	9.7%	11.1%	13.1%	13.2%	13.2%	13.4%	13.9%	14.0%	15.2%	17.0%	24.0%
70% HT 30% DP	21%	0.8%	1.8%	1.9%	3.5%	3.5%	5.2%	6.6%	8.5%	9.7%	11.5%	11.5%	11.6%	11.7%	12.2%	12.3%	13.3%	14.9%	21.0%
100% HT 20% DP 50% HT 40% DP	20%	0.8%	1.7%	1.8%	3.3%	3.3%	5.0%	6.2%	8.1%	9.3%	10.9%	11.0%	11.0%	11.1%	11.6%	11.7%	12.6%	14.2%	20.0%
90% HT 20% DP 60% HT 30% DP	18%	0.7%	1.5%	1.6%	3.0%	3.0%	4.3%	5.6%	7.3%	8.4%	9.8%	9.9%	9.9%	10.0%	10.5%	10.5%	11.4%	12.8%	18.0%
80% HT 20% DP	16%	0.6%	1.4%	1.4%	2.6%	2.6%	4.0%	5.0%	6.5%	7.4%	8.6%	8.6%	8.6%	8.9%	9.3%	9.3%	10.1%	11.3%	16.0%
50% HT 30% DP	15%	0.6%	1.3%	1.4%	2.5%	2.5%	3.7%	4.7%	6.1%	7.0%	8.2%	8.2%	8.3%	8.4%	8.7%	8.8%	9.5%	10.6%	15.0%
70% HT 20% DP	14%	0.5%	1.2%	1.3%	2.3%	2.3%	3.5%	4.4%	5.7%	6.5%	7.7%	7.7%	7.7%	7.8%	8.1%	8.2%	8.8%	9.5%	14.0%
60% HT 20% DP	12%	0.5%	1.0%	1.1%	2.0%	2.0%	3.0%	3.7%	4.8%	5.6%	6.6%	6.6%	6.6%	6.7%	7.0%	7.0%	7.6%	8.3%	12.0%
100% HT 10% DP 50% HT 20% DP	10%	0.4%	0.8%	0.8%	1.6%	1.6%	2.5%	3.1%	4.0%	4.6%	5.5%	5.5%	5.5%	5.6%	5.8%	5.8%	6.3%	7.1%	10.0%
90% HT 10% DP	8%	0.3%	0.8%	0.8%	1.5%	1.5%	2.2%	2.8%	3.6%	4.2%	4.9%	4.9%	5.0%	5.0%	5.2%	5.3%	5.7%	6.4%	9.0%
80% HT 10% DP	7%	0.3%	0.7%	0.7%	1.3%	1.3%	2.0%	2.5%	3.2%	3.7%	4.4%	4.4%	4.4%	4.5%	4.6%	4.7%	5.1%	5.7%	8.0%
70% HT 10% DP	6%	0.2%	0.6%	0.6%	1.2%	1.2%	1.7%	2.2%	2.8%	3.2%	3.8%	3.8%	3.9%	3.9%	4.1%	4.1%	4.4%	5.0%	7.0%
60% HT 10% DP	5%	0.2%	0.5%	0.5%	1.0%	1.0%	1.5%	1.9%	2.4%	2.8%	3.3%	3.3%	3.3%	3.3%	3.5%	3.5%	3.8%	4.3%	6.0%
50% HT 10% DP	5%	0.2%	0.4%	0.5%	0.8%	0.8%	1.2%	1.6%	2.0%	2.3%	2.7%	2.7%	2.8%	2.8%	2.9%	2.9%	3.2%	3.5%	5.0%
Zero Exposure to Environment or Disadvantaged Population	0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

HIT = exposure to High Impact Themes such as climate, education, health care
DP = exposure to a Disadvantaged Population

	< \$5m	\$5-15m	\$26,000	\$20,000	\$15-30m	\$30-50m	\$16,000	\$50-100m	\$10,000	\$8,000	\$6,000	\$4,000	\$2000-3000	\$100m-250m	\$100m-250m	\$500m-1000
70.9% Environmental growth equity, 100% HT Rev \$250-500m																
52.6% Health Fund Growth Equity, 100% HT 90% DP Rev \$100-250m																
50.0% Generalist Growth Equity 0% HT 100% DP Rev > \$500m																
21.9% Health Fund Larger Established Companies 100% HT 40% DP Rev \$8000m																
8.5% Growth Equity 100% HT 100% DP, Rev \$5-15m																
7.1% Growth Equity 100% HT, 10% DP Rev \$250-500m																
6.6% VC 100% HT 40% DP, Rev \$15-30m																
1.0% Growth Equity 50% HT 50% DP, Rev <\$5m																
0.0% LBO Fund, larger companies, 0% HT 0% DP Rev \$20,000m																

Quantity of Output

58.4% New build green buildings at scale																
31.2% Existing Green Buildings at scale																
25.0% Existing sustainable farmland moderate scale																
3.9% New build low income housing, 100% HT, 100% DP small scale																
40.0% Mid Sized listed company, 100% HT, 40% DP Rev \$500-1000m																
4.9% Large Established listed company, 100% HT 30% DP Rev \$20,000m																
1.6% Large Established listed company, 10% HT 20% DP Rev \$20,000m																

Developing Ratings Step 4: Using the General Theory Based Rating Matrix to Improve the Impact Quantity Rating of a Portfolio

At the level of asset classes and the portfolio, investors can use an impact quantity rating matrix like that in Table 11 to estimate the total impact quantity rating of their portfolio and develop strategies to improve the quantity rating.

It would be a very useful and informative exercise to map the dollar value of investable opportunities to the different segments of the rating matrix. My intuition is that the bulk of opportunities by value will be located in the large revenue segments of Segment III, followed by the large revenue segments of Segment IV, followed by Segment II, the larger revenue segments of Segment I and then the lower revenue segments of Segment I.

If this intuition is correct then (i) most large institutional portfolios are likely to currently have portfolio impact quantity scores that fall somewhere in the bottom half of the matrix simply because of their size, (ii) while large institutional investors will be able to improve the impact quantity rating of their portfolios, the degree of improvement will be constrained by the relatively smaller quantity of higher rated assets relative to the size of their portfolios and (iii) smaller portfolios, for example those of endowments and families, will be able to improve their portfolio impact quantity ratings to a greater degree than institutions as the smaller quantity of higher rated assets will not be such a constraint relative to the size of their portfolios.

These constraints of scale, in addition to those of risk and return, suggest that we should not expect to see entire institutional portfolios move into the far top right of the rating matrix.

To illustrate how investors might use the impact quantity rating matrix to think about re-allocation of their portfolios into higher impact-quantity assets, Tables 12 and 13 illustrate what the process might look like in the case of a large institutional investor and a high net worth Family Office.

The asset class exposure ranges come from on-line information on the asset allocations of State Pension Funds and families. The major difference between the allocations is that State funds have more fixed income exposure and less exposure to illiquid alternatives. The caps on the exposure to asset sub-classes are my own invention and are intended to ensure diversification and, in the case of sub-asset classes with a smaller investable universe, avoid unrealistically large allocations that would be difficult to achieve.

Both portfolios begin with an asset allocation which is (i) within exposure limits (ii) favors larger sub-asset classes over smaller ones and (iii) is neutral on impact.

The exercise is then to maximize the impact quantity rating while staying within exposure limits.

By prioritizing impact quantity while staying within exposure limits both States and families manage to almost double the impact quantity rating of their portfolios. To achieve this result States re-allocate 53% of their portfolio to higher-rated assets, of which 14% is to high impact quantity assets (rating > 20%). Families re-allocate 62% of their portfolios to higher-rated assets, of which 46% are high impact assets.

After re-allocation both groups have improved their portfolio impact quantity ratings enough to be located in the higher-rated green shaded part of the rating matrix, but not right at the top.

Families are able to achieve a higher portfolio impact quantity rating than States because of their greater risk tolerance (greater allocation to illiquid alternatives) and because their smaller portfolio size allows them flexibility to place a greater percentage of their portfolios into smaller-but-higher-impact asset classes.

Table 14 (page 18) shows the movement of the two portfolios to higher positions within the impact quantity rating matrix.

Table 12 Example of Portfolio Re-Allocation

State Pension Fund Asset Allocation	Asset Classes	Range	Cap	Impact Rating	Sub-Asset Classes	Current Weighting	Check not Over-Weight	Portfolio Impact rating	Revised Weighting	Check not Over-Weight	Revised Portfolio Impact Rating	Re-allocation to a higher rated asset	Re-allocation to high impact assets
	State Pension Fund Asset Allocation	Listed Equity	30-40%	32%	1.6%	Large Cap developed markets	27.0%		0.43%			0.0%	-27.0%
16%				9.0%	Mid Cap developed markets	9.50%		0.86%	16%		1.4%	6.5%	
4%				9.0%	Small Cap developed markets	2.00%		0.18%	4%		0.4%	2.0%	
4%				20.0%	Mid Cap Developed Markets High Impact Sectors	1.00%	39.5%	0.20%	4%	24.0%	0.8%	3.0%	3.00%
20%				14.5%	Emerging Markets, Generalist mid to large cap	10.00%	10.0%	1.45%	20%	20.0%	2.9%	10.0%	
Debt		25-35%	28%	7.5%	Sovereign Developed Markets	6.00%		0.45%	8%		0.6%	2.0%	
			18%	1.6%	Large Cap developed markets	12.25%		0.20%			0.0%	-12.3%	
			18%	9.0%	Mid Cap Developed Markets	5.25%		0.47%	18%		1.6%	12.8%	
			7%	20.0%	Developed Market High Impact Sectors	10.00%	33.5%	2.00%	7%	33.0%	1.4%	-3.0%	-3.00%
			1-3%	3%	25.0%	Sovereign Emerging Markets	2.00%	2.0%	0.50%	3%	3.0%	0.8%	1.0%
Private Equity		3-10%	10%	0.0%	Developed Market LBO	3.00%		0.00%			0.0%	-3.0%	
			10%	7.0%	Developed Market Buyout	3.00%		0.21%			0.0%	-3.0%	
			5%	15.0%	Developed Market Growth	2.00%		0.30%	5%		0.8%	3.0%	
			3%	20.0%	Mid Market High Impact Sectors	1.00%	9.0%	0.20%	3%	8.0%	0.6%	2.0%	2.00%
			1-2%	2%	25.0%	Emerging Markets Generalist	1.00%	1.0%	0.25%	2%	2.0%	0.5%	1.0%
Real Assets		3-10%	10%	0.0%	Existing Developed Market Commercial RE, not Green	5.00%		0.00%			0.0%	-5.0%	
			10%	25.0%	Existing Developed Market Commercial RE, Green, mid scale			0.00%	3%		0.8%	3.0%	3.00%
			2%	31.2%	New Build Green, large scale			0.00%	2%		0.6%	2.0%	2.00%
			3%	25.0%	Existing Sustainable Farm Land, mid scale			0.00%	3%		0.8%	3.0%	3.00%
			2%	31.2%	Conversion of land to sustainable use, large scale		5.0%	0.00%	2%	10.0%	0.6%	2.0%	2.00%
Total Portfolio 100%						100.00%		100.0%	100.0%		0.0%		
Portfolio Impact rating								7.70%			14.47%		
Proportion of portfolio re-allocated to assets with a higher impact rating												53.3%	
Increase in exposure to high impact assets (rating > 20%)													14%

Table 13 Example of Portfolio Re-Allocation

Family Office Asset Allocation	Asset Classes	Range	Cap	Impact Rating	Sub-Asset Classes	Current Weighting	Check not Over-Weight	Portfolio Impact rating	Revised Weighting	Check not Over-Weight	Revised Portfolio Impact Rating	Re-allocation to a higher rated asset	Re-allocation to high impact assets
	Family Office Asset Allocation	Listed Equity (50 cap)	30-50%	35%	1.6%	Large Cap developed markets	12.0%		0.19%			0.0%	-12.0%
20%				9.0%	Mid Cap developed markets	12.0%		1.08%	3%		0.2%	-9.5%	
10%				9.0%	Small Cap developed markets	8.0%		0.72%	3%		0.2%	-5.5%	
10%				20.0%	Mid Cap Developed Markets High Impact Sectors	3.0%	35.0%	0.60%	10%	15.0%	2.0%	7.0%	7.00%
20%				14.5%	Emerging Markets, Generalist mid to large cap	15.0%	15.0%	2.18%	20%	20.0%	2.9%	5.0%	
Debt		10-20%	15%	7.5%	Sovereign Developed Markets	5.0%		0.38%			0.0%	-5.0%	
			15%	1.6%	Large Cap developed markets	5.0%		0.08%			0.0%	-5.0%	
			15%	9.0%	Mid Cap Developed Markets	5.0%		0.45%			0.0%	-5.0%	
			10%	20.0%	Developed Market High Impact Sectors	3.0%	18.0%	0.60%	10%	10.0%	2.0%	7.0%	7.00%
			1-5%	5%	25.0%	Sovereign Emerging Markets		0.00%	0.00%	5%	5.0%	1.3%	5.0%
Private Equity (20 cap)		10-20%	15%	0.0%	Developed Market LBO	6.0%		0.00%			0.0%	-6.0%	
			15%	7.0%	Developed Market Buyout	4.0%		0.28%			0.0%	-4.0%	
			15%	15.0%	Developed Market Growth	4.0%		0.60%	10%		1.5%	6.0%	
			10%	20.0%	Mid Market High Impact Sectors	2.0%	16.00%	0.40%	10%	20.0%	2.0%	8.0%	8.00%
			1-10%	10%	25.0%	Emerging Markets Generalist	4.0%	4.00%	1.00%	10%	10.0%	2.5%	6.0%
Real Assets		8-20%	15%	0.0%	Existing Developed Market Commercial RE, not Green	5.0%		0.00%			0.0%	-5.0%	
			15%	25.0%	Existing Developed Market Commercial RE, Green, mid scale	2.0%		0.50%	10%		2.5%	8.0%	8.00%
			5%	31.2%	New Build Green, large scale			0.00%	5%		1.6%	5.0%	5.00%
			5%	25.0%	Existing Sustainable Farm Land, mid scale	5.0%		1.25%			0.0%	-5.0%	-5.00%
			5%	31.2%	Conversion of land to sustainable use, large scale		12.00%	0.00%	5%	20.0%	1.6%	5.0%	5.00%
Total Portfolio 100%						100.00%		100%	100.00%	100%		0.0%	
Portfolio Impact rating								10.30%			20.22%		
Proportion of portfolio re-allocated to assets with a higher impact rating												62.0%	
Increase in exposure to high impact assets (rating > 20%)													46%

	100%	90%	80%	70%	60%	50%	40%	30%	20%	10%	0%	Quantity of Output					
100% exposure to both HIT and DP	16.5%	8.5%	9.0%	16.5%	25.0%	31.2%	40.4%	46.4%	54.7%	54.8%	55.0%	55.7%	58.1%	58.4%	63.2%	70.9%	100.0%
100% HT 90% DP / 90% HT 100% DP	3.5%	7.6%	8.1%	14.8%	22.3%	28.1%	36.3%	41.8%	49.2%	49.3%	49.5%	50.2%	52.3%	52.6%	56.8%	63.4%	81.0%
90% HT 90% DP	3.1%	6.9%	7.3%	13.3%	20.1%	25.3%	32.7%	37.6%	44.3%	44.4%	44.6%	45.1%	47.0%	47.3%	51.2%	57.8%	76.0%
100% HT 80% DP / 80% HT 100% DP	3.1%	6.8%	7.2%	13.2%	19.8%	25.0%	32.3%	37.1%	43.8%	43.8%	44.0%	44.6%	46.5%	46.7%	50.5%	56.7%	75.0%
90% HT 80% DP / 80% HT 90% DP	2.8%	6.1%	6.5%	11.9%	17.8%	22.5%	29.1%	33.4%	39.8%	39.5%	39.6%	40.1%	41.8%	42.1%	45.5%	51.0%	70.0%
100% HT 70% DP / 70% HT 100% DP	2.7%	5.9%	6.3%	11.5%	17.3%	21.9%	28.3%	32.5%	38.4%	38.5%	38.6%	39.0%	40.7%	40.9%	44.2%	49.6%	70.0%
80% HT 70% DP / 70% HT 90% DP	2.5%	5.4%	5.8%	10.5%	15.9%	20.5%	25.8%	29.7%	35.0%	35.1%	35.2%	35.7%	37.2%	37.4%	40.4%	45.4%	64.0%
90% HT 70% DP / 70% HT 80% DP	2.4%	5.3%	5.7%	10.4%	15.6%	19.7%	25.4%	29.2%	34.5%	34.5%	34.7%	35.1%	36.6%	36.8%	39.8%	44.7%	63.0%
100% HT 60% DP / 60% HT 100% DP	2.3%	5.1%	5.4%	9.9%	14.9%	18.7%	24.2%	27.8%	32.8%	32.9%	33.0%	33.4%	34.8%	35.0%	37.9%	42.5%	60.0%
80% HT 70% DP / 70% HT 80% DP	2.2%	4.7%	5.1%	9.2%	13.9%	17.5%	21.8%	25.0%	30.5%	30.7%	30.8%	31.2%	32.5%	32.7%	35.4%	39.7%	56.0%
90% HT 60% DP / 60% HT 90% DP	2.1%	4.6%	4.9%	8.9%	13.4%	16.9%	21.8%	24.6%	29.5%	29.5%	29.7%	30.1%	31.4%	31.5%	34.1%	38.3%	54.0%
100% HT 50% DP / 50% HT 100% DP	1.9%	4.2%	4.5%	8.2%	12.4%	15.6%	20.2%	23.2%	27.3%	27.4%	27.5%	27.9%	29.0%	29.2%	31.6%	35.4%	50.0%
70% HT 70% DP	1.9%	4.2%	4.4%	8.1%	12.1%	15.3%	19.8%	22.7%	26.8%	26.9%	27.0%	27.3%	28.3%	28.5%	30.9%	34.7%	48.0%
80% HT 60% DP / 60% HT 80% DP	1.9%	4.1%	4.3%	7.9%	11.9%	15.0%	19.4%	22.3%	26.3%	26.4%	26.5%	26.8%	27.9%	28.0%	30.3%	34.0%	48.0%
90% HT 50% DP / 50% HT 90% DP	1.7%	3.8%	4.1%	7.4%	11.2%	14.1%	18.2%	20.9%	24.6%	24.7%	24.8%	25.1%	26.1%	26.3%	28.4%	31.9%	45.0%
100% HT 40% DP / 40% HT 100% DP	1.6%	3.6%	3.8%	6.9%	10.4%	13.1%	17.0%	19.5%	23.0%	23.0%	23.1%	23.4%	24.4%	24.5%	26.5%	29.8%	42.0%
80% HT 40% DP / 40% HT 80% DP	1.5%	3.5%	3.6%	6.6%	9.9%	12.5%	16.1%	18.6%	21.5%	21.5%	21.6%	21.9%	22.9%	23.0%	25.0%	28.4%	40.0%
90% HT 30% DP / 30% HT 90% DP	1.4%	3.1%	3.2%	5.9%	8.9%	11.2%	14.5%	16.7%	19.7%	19.7%	19.8%	20.1%	20.9%	21.0%	22.7%	25.5%	36.0%
100% HT 20% DP / 20% HT 100% DP	1.4%	3.0%	3.2%	5.8%	8.7%	10.9%	14.1%	16.2%	19.1%	19.2%	19.3%	19.5%	20.3%	20.4%	22.1%	24.8%	35.0%
70% HT 50% DP / 50% HT 70% DP	1.2%	2.7%	2.9%	5.3%	7.9%	10.0%	12.9%	14.8%	17.5%	17.5%	17.6%	17.8%	18.6%	18.7%	20.2%	22.7%	32.0%
80% HT 40% DP	1.2%	2.5%	2.7%	4.9%	7.4%	9.4%	12.1%	13.9%	16.4%	16.4%	16.5%	16.7%	17.4%	17.5%	18.9%	21.3%	30.0%
90% HT 30% DP / 30% HT 60% DP	1.1%	2.4%	2.5%	4.6%	6.9%	8.7%	11.3%	13.0%	15.3%	15.3%	15.4%	15.6%	16.3%	16.4%	17.7%	19.8%	28.0%
100% HT 20% DP	1.0%	2.3%	2.4%	4.4%	6.7%	8.4%	10.9%	12.5%	14.8%	14.8%	14.9%	15.0%	15.7%	15.8%	17.1%	19.1%	27.0%
90% HT 30% DP	1.0%	2.1%	2.3%	4.1%	6.2%	7.8%	10.1%	11.6%	13.7%	13.7%	13.8%	13.9%	14.5%	14.6%	15.8%	17.7%	25.0%
80% HT 50% DP / 50% HT 40% DP	0.9%	2.0%	2.2%	4.0%	6.0%	7.5%	9.7%	11.1%	13.1%	13.2%	13.2%	13.4%	13.9%	14.0%	15.2%	17.0%	24.0%
70% HT 30% DP	0.8%	1.8%	1.9%	3.3%	5.2%	6.6%	8.5%	9.7%	11.5%	11.5%	11.6%	11.8%	12.2%	12.3%	13.3%	14.9%	21.0%
100% HT 20% DP / 50% HT 40% DP	0.8%	1.7%	1.8%	3.3%	5.0%	6.2%	8.1%	9.3%	10.9%	10.9%	11.0%	11.1%	11.6%	11.7%	12.6%	14.2%	20.0%
90% HT 20% DP / 60% HT 30% DP	0.7%	1.5%	1.6%	3.0%	4.6%	5.6%	7.3%	8.4%	9.8%	9.8%	9.9%	10.0%	10.5%	10.5%	11.4%	12.8%	18.0%
80% HT 20% DP	0.6%	1.4%	1.4%	2.6%	4.0%	5.0%	6.5%	7.4%	8.8%	8.8%	8.8%	8.9%	9.3%	9.3%	10.1%	11.3%	16.0%
90% HT 30% DP	0.6%	1.3%	1.4%	2.5%	3.7%	4.7%	6.1%	7.0%	8.2%	8.2%	8.3%	8.4%	8.7%	8.8%	9.5%	10.6%	15.0%
70% HT 50% DP	0.5%	1.2%	1.3%	2.3%	3.5%	4.4%	5.7%	6.5%	7.7%	7.7%	7.7%	7.8%	8.1%	8.2%	8.8%	9.9%	14.0%
80% HT 20% DP / 50% HT 20% DP	0.5%	1.0%	1.1%	2.0%	3.0%	3.7%	4.8%	5.6%	6.6%	6.6%	6.6%	6.7%	7.0%	7.0%	7.6%	8.5%	12.0%
100% HT 10% DP	0.4%	0.8%	0.9%	1.6%	2.5%	3.1%	4.0%	4.6%	5.5%	5.5%	5.5%	5.6%	5.8%	5.8%	6.3%	7.1%	10.0%
90% HT 10% DP	0.3%	0.8%	0.8%	1.5%	2.2%	2.8%	3.6%	4.2%	4.9%	4.9%	5.0%	5.0%	5.2%	5.3%	5.7%	6.4%	9.0%
80% HT 10% DP	0.3%	0.7%	0.7%	1.3%	2.0%	2.5%	3.2%	3.7%	4.4%	4.4%	4.4%	4.5%	4.6%	4.7%	5.1%	5.7%	8.0%
70% HT 10% DP	0.3%	0.6%	0.6%	1.2%	1.7%	2.2%	2.8%	3.2%	3.8%	3.8%	3.9%	3.9%	4.1%	4.1%	4.4%	5.0%	7.0%
60% HT 10% DP	0.2%	0.5%	0.5%	1.0%	1.5%	1.9%	2.4%	2.8%	3.3%	3.3%	3.3%	3.3%	3.5%	3.5%	3.8%	4.3%	6.0%
50% HT 10% DP	0.2%	0.4%	0.5%	0.8%	1.2%	1.5%	2.0%	2.3%	2.7%	2.7%	2.8%	2.8%	2.9%	2.9%	3.2%	3.5%	5.0%
0% DP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

HIT = exposure to High Impact Themes such as climate, education, health care
DP = exposure to a Disadvantaged Population

	50-50m	\$5-15m	\$25,000	\$50,000	\$100,000	\$150,000	\$200,000	\$300,000	\$400,000	\$500,000	\$1,000,000	\$2,000,000	\$5,000,000	\$10,000,000
70.9% Environmental growth equity, 100% HIT Rev \$250-500m														
52.6% Health Fund Growth Equity, 100% HT 90% DP Rev \$100-250m														
50.0% Generalist Growth Equity 0% HT 100% DP Rev > \$500m														
21.9% Health Fund Larger Established Companies 100% HT 40% DP Rev \$8000m														
8.5% Growth Equity 100% HT 100% DP, Rev \$5-15m														
7.1% Growth Equity 100% HT, 10% DP Rev \$250-500m														
6.6% VC 100% HT 40% DP, Rev \$15-30m														
1.0% Growth Equity 50% HT 50% DP, Rev <\$5m														
0.0% LBO Fund, larger companies, 0% HT 0% DP Rev \$20,000m														

While these examples illustrate the logic of the re-allocation process, I believe they over-state what is likely to be achieved in practice as they are highly simplified and omit several important considerations.

- In a full portfolio optimization exercise there are further constraints in addition to exposure limits, such as expected return, expected volatility, correlation and illiquidity. These additional constraints will limit the extent to which investors can re-allocate their portfolios to achieve higher impact ratings. The effect of these additional constraints is suggested by the optimization exercise mentioned in “Pricing Impact” (Chart 28 page 77) which improved the impact rating by 27% through re-allocating 40% of the portfolio to higher rated assets.
- The size constraint of some of the smaller sub-asset classes may prove to be more limiting than suggested in these examples.
- Time will be needed to make re-allocations. Repositioning large portfolios to improve their impact quantity ratings will be a gradual process. It will take time to identify higher rated assets to bring into portfolios. Positions will need to be sold gradually so as to not disrupt markets.

Despite the various limitations on portfolio re-allocation, achieving the SDGs does not require re-allocations of the magnitude occurring in these examples. Institutional investors have around \$81 trillion in assets and the SDGs have been estimate to require \$9.6 trillion of private capital to achieve.

Developing Ratings Step 5: Using the General Theory Based Rating Matrix with Individual Assets

The impact of individual assets can be and should be assessed using a much broader range of information than the general theory based impact quantity rating methodology, as discussed in “Pricing Impact”.

However, this does not mean that there is no role for the general theory in the selection of individual assets.

On the contrary, a general theory based impact quantity rating method can be a very useful tool with which to make an initial sorting of prospective investments, identifying assets as strong, moderate or weak prospects.

Further, the data required to operationalize a general theory based rating methodology is relatively simple.

As an example of a simple gating mechanism, we can consider the two investment portfolios above with impact quantity ratings of 7.7% and 10.3%. The addition of any assets with a rating above these numbers will improve the impact quantity rating of the overall portfolio.

Table 15 (page 20) shows these two portfolios positioned on the rating matrix. For the State portfolio with an impact quantity rating of 7.7%, an asset which corresponds to any of the pale orange, blue or green squares in the matrix will improve the impact rating of the portfolio. For the family office portfolio with an impact quantity rating of 10.3%, an asset which corresponds to any of the blue or green squares in the matrix will improve the impact quantity rating of the portfolio.

If an investor aims to get the impact quantity rating of her portfolio into the green area of the matrix representing a higher impact quantity level, then clearly the target should be to include as many assets which correspond to green squares on the rating matrix as possible.

However, any asset with a rating above that of the portfolio will improve the portfolio rating.

When assessing individual assets using the general theory based rating methodology, the data for the individual asset needs to be acquired in order to place the asset correctly within the matrix.

While the average numbers for a sub-asset class can be used for portfolio allocation, they are not adequate to use in association with individual assets as not all assets will conform to the average.

Examples to demonstrate this point are provided in Table 16. In each example the revenue growth of the individual asset deviates from the average of the sub-asset class, with noticeable effect on the impact quantity rating. This demonstrates that while the sub-asset class averages are sufficient for the purposes of guiding portfolio asset allocation, data on the individual asset being considered is required if a general theory based rating method is used as an initial screening mechanism for individual assets.

Table 16 Examples of Individual Assets Varying From the Sub-Asset Class Average

	Revenue Growth	Quantity Score	HIT	DP	Impact Rating
Healthcare Growth Equity Fund in the \$500-1000m revenue range with average quantity attributes	4.40%	100%	100%	70%	70.0%
Healthcare Growth Equity Fund in the \$500-1000m revenue range with below average revenue growth	2%	43%	100%	70%	30.1%
Listed Healthcare company in the \$2000-3000mm revenue range with average quantity attributes	1%	56%	80%	40%	17.8%
Listed Healthcare company in the \$2000-3000mm revenue range with above average revenue growth	3%	176%	80%	40%	56.3%

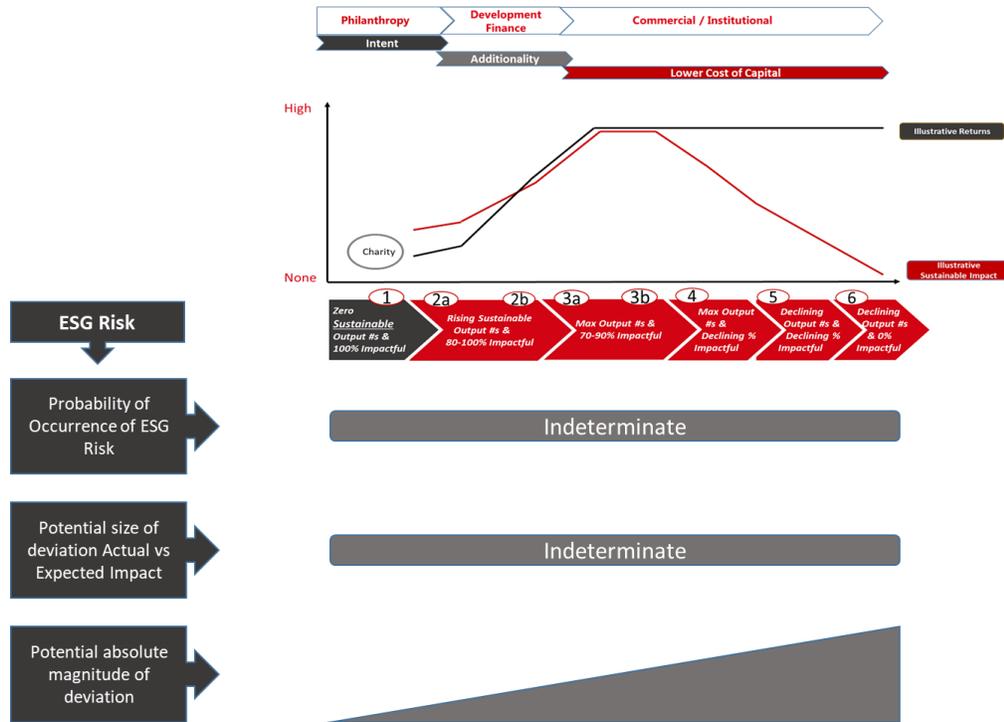
It is worth remembering that rating an individual asset’s potential to create a quantity of impact is only the first of three steps required to select individual assets for investment. Referring to Chart 4, after (i) rating the quantity of impactful outputs an asset is likely to produce we have an estimate of the assets gross impact, but we still need to (ii) examine its ESG characteristics which, when combined with the estimate of the quantity of impactful outputs from (i), gives us an estimate of net impact and (iii) see how relevant the asset is to the mandate of the portfolio.

The examination of ESG characteristics is important for all investors in order to avoid negative outputs and to reach an estimate of net impact.

It may be particularly important for institutional investors with very large portfolios who are likely, due to the necessity of size, to be heavily exposed to the largest companies and projects. As noted in “Pricing Impact” the absolute magnitude of ESG risk is likely to increase with scale, as illustrated in Chart 5 (Chart 32 page 87 in “Pricing Impact”). For large institutional investors improving the impact quantity rating of

their portfolios and ensuring good ESG standards may both make significant contributions to meeting the SDGs.

Chart 5 The Three Dimensions of ESG Risk



The final step in selecting individual assets, ensuring the asset is a good fit for the investor’s mandate, is where assets with low impact quantity ratings located in Segment I of the impact quantity rating matrix will receive a higher rating from investors whose mandates require these types of assets.

For example, ‘new build low income housing at small scale’ receives an impact quantity rating of only 3.9% in Table 14, while the mid-sized listed company with 100% exposure to a High Impact Sector, 40% exposure to a Disadvantaged Population and revenue of \$500-1000m gets an impact quantity rating of 40%. An investor whose mandate includes intent or additionality will, for the purposes of their strategy, give the mid-sized listed company an overall rating of 0 as the company does not meet the requirements of intent or additionality required by the mandate. This same investor will also give the small scale new build low income housing a much higher overall rating than 3.9% as the low income housing is very likely to meet intent and additionality requirements.

The context of an investor’s mandate changes the desirability of an asset to that investor without altering the fundamental characteristics of the asset: risk, return, quantity of impactful outputs, ESG characteristics.

Rating the quantity of impactful outputs that an asset is likely to produce is a very important part of any framework for impact investing. However, it is one of three parts, along with ESG and investor’s mandates, of a fully integrated process with which to incorporate impact into portfolio management.

Work Required to Further Develop a General Theory Based Impact Rating Methodology

- Indicator of quantity of output. Deeper revenue and employment data across a broader range of company sizes is needed to improve the quality of the output measure.
- Incorporating new construction of green/impactful assets and conversion of existing non-impactful assets to impactful use into the impact rating matrix. Work needs to be done to examine the relationship between the final value of new construction/converted assets and impact outputs and to calibrate this with the revenue-based measure.
- Incorporating existing stocks of impactful assets into the framework. Value might be used as an indicator of scale, but work needs to be done to calibrate the contribution of a stock with the contribution of the creation of an additional quantity of outputs.
- Incorporating assets with a high exposure to disadvantaged populations but little exposure to high impact themes into the framework. Work needs to be undertaken to identify a logical and consistent basis for including these assets.
- Sovereign Bonds. Work needs to be undertaken to identify a logical and consistent basis for including these assets.
- Mapping the dollar value of investable assets onto the rating matrix would provide useful information on several fronts. For example, to get a better appreciation of the limits faced by investors in re-allocating capital to various sectors; to help investors to identify opportunities; to identify where policy makers may want to stimulate activity.