

## 4 Impact of Increased Inclusion on EU Economy<sup>10</sup>

### 4.1 Explanation of Estimation Approach

This analysis is based on the pioneering work in estimating the potential economic impact of inclusion first used in the University of Toronto's Martin Prosperity Institute's work [Releasing Constraints](#) by Kemper, Stolarick, Milway, and Treviranus. Estimates are based on the assumption that increased inclusion creates increased opportunities that can be realized. These are potential opportunities based on achieving a very high (and likely unattainable but still aspirational) level of inclusion that are then adjusted to reflect expectations.

This analysis proceeds in two steps and in two different areas of potential impact. The first step is to estimate the potential impact of increased inclusion at an overall macroeconomic level. Estimates are developed for the entire EU and then on a country by country basis for each of the member states. These estimates are adjusted to reflect optimistic, realistic, and pessimistic expectations around the effectiveness of increased inclusion efforts. Once developed, these estimates show the annual macroeconomic impact that could be generated by successfully increasing economic inclusion of people with disabilities. These estimates are based on creating a full spectrum of inclusion that spans across the full range of possible challenges from physical, medical, mental, lifestyle, and other limitations.

Prosperity4All is not designed to address this full spectrum. Rather, Prosperity4All addresses inclusion across ICTs and focuses on developing the infrastructure to allow a new ecosystem to grow; one that is based on self-rewarding collaboration, that can reduce redundant development, lower costs, increase market reach and penetration internationally, and create the robust cross-platform spectrum of mainstream and assistive technology based access solutions required. While that development has the potential to impact a wide swath of disability-related challenges, by design, it will not address all the limitations that would be needed to achieve the full estimated impact. The second step is to take the estimates from the first step and reduce them to only include the potential impacts that could be expected from the implementation of Prosperity4All.

This analysis also considers two different areas of potential impact. The first is labor market impacts. By examining the differences for employment, income, and educational attainment between the EU-wide and national averages and those with disabilities, the impact from closing the gap can be estimated. What would happen if people with disabilities were employed at the same level as the population? What if their earnings had the same distribution? What if their educational attainment levels were the same as the EU or national

<sup>10</sup> Full version of this report available at [https://wiki.gpii.net/w/EEM\\_Macro\\_EU](https://wiki.gpii.net/w/EEM_Macro_EU)  
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average? This impact is based on the (somewhat) “heroic” but necessary assumption that this level of inclusion could be achieved, but those estimates do take degree of disability into account and also are then adjusted to differing potential expectations.

The second area of potential impact that is included considers the macroeconomic effects on the market for goods and services that could be expected from increased inclusion. This impact is at two levels. The first is the general market for retail goods and services. Increased inclusion creates a larger market with correspondingly greater demand. Inclusion, by definition, means that more people are able to access retail opportunities to purchase goods and services. This is especially true in the realm of ICT enabled markets which make up an increasing share of the general retail market. The potential impact on retail markets is made assuming the implementation of Prosperity4All. The impact is estimated as a range which reflects a percentage increase in market size. The second level of market impacts is more specific to Prosperity4All. It is an estimate of the impact on the market for accessibility technologies and other accessibility-related goods and services. As specific estimates of the current market size for accessibility-related goods and services is not available, this is estimated using the current market for ICT goods and services.

With all of the estimates developed in this report, the intention is to provide clarity about the assumptions and the methods used to generate those estimates. The reader is encouraged to question the assumptions and develop their own robust estimates based on their assumptions. The question is not whether the impacts outlined here will happen. They will to some degree and will increase with greater inclusion. The question is the degree to which they will happen. Even at one-tenth of the impact estimated here, the results are still important and significant, and that is the broader point of this analysis.

#### **4.1.1 Usefulness of this analysis to the rest of the project**

The estimates developed here are high-level and are intended to show the potential macroeconomic impact of increased inclusion across the EU and within its member states. These estimates are not individual estimates of impact from individual components and sub-projects of Prosperity4All. By design, these estimates show the potential economic impact created by the development of the inclusive ecosystem that the Prosperity4All infrastructure will enable. This is potential system-wide, top-down impact estimates and not a bottom-up aggregation of individual estimates of specific components.

These estimates are designed to show the significant potential impact that could be realized from increased inclusion across Europe. For the individual components and sub-projects of Prosperity4All, these estimates provide a greater sense of the scope of impact of this project and what greater inclusion for people with disabilities could mean for the economies of Europe. Additionally, these estimates document the benefits of greater inclusion. This should serve as a clarion call and motivation for the Prosperity4All project teams to

always strive for greater inclusion and the development of more inclusive designs and approaches as outlined in other SP1 deliverables. The estimates presented here show the potential of what could happen – it is the challenge to the project teams to implement solutions that realize this potential.

## 4.2 EU-wide & Country-specific

### 4.2.1 Labor Market Impacts

For each set of estimates, first the overall EU estimate will be presented. (The individual member state estimates are in the separate report.)

#### 4.2.1.1 Inclusion in Employment

**Table 2: Inclusion in Employment (EU wide)**

EU	EU27/28 <sup>11</sup> (M)	LD_1 (000)	LD_2-3 (000)	LD_GE4 (000)	Any Limitation (000)
Population	329.34	25,936.80	21,025.20	26,068.50	73,030.50
Employed	213.38	9,048.80	4,554.90	2,948.10	16,551.80
Share Employed	64.8%	34.9%	21.7%	11.3%	22.7%
Gap (%)		29.9%	43.1%	53.5%	42.1%
Gap (people)		7,755.81	9,067.45	13,941.84	30,765.10
Average Wage (€)	18,080				

Assumptions		LD_1 (M €)	LD_2-3 (M €)	LD_GE4 (M €)	Total (M €)
Optimistic	100-75-25	140,225	26,637	63,017	229,879
Realistic	75-50-25	05,169	17,758	63,017	185,944
Pessimistic	50-25-10	0,113	8,879	25,207	104,198

Increased economic inclusion of people with disabilities could generate between 100 and 230 billion Euro in additional employment income every year. While getting to the point of closing the employment gap

<sup>11</sup> The data used is from 2013 and does not include Croatia which officially joined the EU in 2014.  
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(pessimistic assumption) for 50% of those with a mild disability (LD\_1), 25% of those with a moderate disability (LD\_2-3) and 10% of those with a severe disability (LD\_GE4) would be a significant undertaking and require action well beyond what is being taken by Prosperity4All, the potential macroeconomic impact is significant.

The table below summarizes the results for each of the 25 countries for which detailed data to develop the estimates is available. When considered on an individual basis, which compares overall employment rates at the country level to that same country’s employment rates for people with disabilities (so, for example, the estimates use Greece’s 49.4% employment rate as the baseline to reach for those with a disability but also considers Germany’s 73.8% employment rate), the aggregate impact is higher than the impact calculated using EU average values. At a country level, the potential impact of inclusion in employment obviously varies by country size but still ranges in the hundreds of millions to billions of Euro annually.

**Table 3: Inclusion in Employment (Country Estimates)**

Country	Optimistic 100-75-25 (M €)	Realistic 75-50-25 (M €)	Pessimistic 50-25-10 (M €)
<b>EU28/27</b>	229,879.0	185,943.8	104,198.3
<b>25 Countries Aggregate<sup>12</sup></b>	231,924.8	186,477.7	105,113.7
<b>Belgique/België</b>	5,008.5	4,066.3	2,256.6
<b>Bulgarija</b>	1,163.1	928.9	548.0
<b>Česká republika</b>	2,373.4	1,940.3	1,086.4
<b>Danmark</b>	5,371.2	4,352.7	2,399.1
<b>Deutschland</b>	59,658.2	47,354.0	26,646.9
<b>Elláda</b>	2,115.0	1,705.7	982.3
<b>España</b>	16,601.6	13,465.2	7,622.5
<b>France</b>	29,582.3	23,603.5	13,446.3

<sup>12</sup> As previously noted, Croatia is not included as it was not part of the EU when the EHSIS survey was completed. Additionally, data from Estonia and Ireland was not available and is not separately reported here.

Country	Optimistic	Realistic	Pessimistic
	100-75-25	75-50-25	50-25-10
	(M €)	(M €)	(M €)
Italia	21,188.4	17,294.1	9,843.2
Kýpros	325.2	262.1	146.8
Latvija	500.4	399.6	230.0
Lietuva	697.8	562.9	323.0
Luxembourg	315.7	246.8	139.5
Magyarország	1,802.5	1,509.5	811.4
Malta	146.5	114.3	69.8
Nederland	10,097.8	7,902.0	4,548.4
Österreich	6,687.0	5,181.2	3,135.5
Polska	7,210.5	5,856.6	3,345.3
Portugal	2,491.3	1,974.0	1,176.7
România	1,358.0	1,137.9	612.2
Slovenija	743.5	595.9	340.8
Slovensko	1,061.5	833.4	491.7
Suomi/Finland	4,267.9	3,342.1	1,978.8
Sverige	7,231.6	5,590.6	3,347.0
United Kingdom	43,925.8	36,258.2	19,585.4

#### 4.2.1.2 Inclusion in Income Distribution

A second approach to estimating the potential macroeconomic impact of inclusion is to consider the distribution of income and compare the distribution of income for the general population and those with disabilities. The gaps in the distributions can then be identified and estimates made from closing those gaps. Again, separate estimates can be developed based on severity of disability (LD\_1, LD\_2-3, LD\_GE4) with optimistic, realistic, and pessimistic assumptions for narrowing those gaps. As before, estimates using values for the entire EU are first developed, followed by estimates for the individual member states. Again,

the overall macroeconomic (income quartile distribution) data are from 2013 and the data on disabilities is from the 2012 EHSIS survey results.

**Table 4: Inclusion in Income Distribution (EU wide)**

EU 27		Share				Gap		
Quintile	Range (€)	Share	LD_1	LD_2-3	LD_GE4	LD_1	LD_2-3	LD_GE4
1	0 - 10,111	20%	32.3%	38.1%	46.8%	-12.3%	-18.1%	-26.8%
2	10,111 - 13,652	20%	22.5%	24.4%	23.8%	-2.5%	-4.4%	-3.8%
3	13,652 - 17,540	20%	20.1%	18.4%	16.2%	-0.1%	1.6%	3.8%
4	17,540 - 23,308	20%	14.7%	12.4%	8.8%	5.3%	7.6%	11.2%
5	23,308 +	20%	10.4%	6.7%	4.4%	9.6%	13.3%	15.6%

		Number of People Shift In/Out (000)		
Quintile	Midpoint (€)	LD_1	LD_2-3	LD_GE4
1	5,056	-3,202	-3,809	-6,993
2	11,882	-647	-935	-1,002
3	15,596	-28	345	1,000
4	20,424	1,383	1,607	2,925
5	23,308	2,495	2,793	4,070

Assumptions		LD_1 (M €)	LD_2-3 (M €)	LD_GE4 (M €)	Total (M €)
Optimistic	100-75-25	62,066	54,691	30,735	147,492
Realistic	75-50-25	46,549	36,461	30,735	113,745
Pessimistic	50-25-10	31,033	18,230	12,294	61,557

Some explanation is needed for each table. The first shows how the income distributions are different between the overall population and the population of people with disabilities. While for the overall population, 20% of the total is in each income quintile, that is not the case for people with disabilities who

are strongly over-represented in the lower income quintiles and under-estimated in the higher income quintiles. As a result, you have a negative gap when the share is higher than it should be and a positive gap when the share is lower.

The second table shows the number of individuals for each severity level that would have to shift for the income distribution among those with a disability to be the same as the overall income distribution for the EU. It shows the number of people who would have to move out of each lower income quintile and the number that would have to move into the higher income quintiles. When overall impact is calculated, the midpoint of lower income quintiles is subtracted out and the midpoint from higher income quintiles is added back in to develop a net change impact.

The final table shows the results, using the previous assumptions of varying percentages in accomplishing the necessary changes to achieve that percentage of the net change impact. So, for example, the optimistic assumption would be that 100% of the shift could be made for people with a mild disability (LD\_1) and 75% of the shift for those with a moderate disability (LD\_2-3) and 25% of the necessary shift among the income quintiles for those with a severe disability (LD\_GE4). So, the impact of the full shift as shown in the second table is first calculated, and this is then weighted by the percentage assumptions. If the full shift (moving everyone with a severe disability so their income distribution was 20% in each quintile) could be made, the overall impact would be to increase wages annually across the EU by nearly 123 million Euro.

The EU-wide results show that if even a portion of the necessary shift in incomes could be made so that the income distribution for people with disabilities could more resemble the average distribution the annual increase in incomes would range from 61 to nearly 150 million Euro.

The table below shows the country by country estimates for the 25 countries for which data is available. It also shows the aggregate of those 25 countries which is slightly lower than the EU-wide estimated impact. This difference is due to the variability in income quintile ranges across countries and the use of quintile midpoints for the estimates, but the results are very similar. As with employment, increased inclusion for people with disabilities across the countries of the EU could result in annual income increases in the hundreds of millions to billions of Euro.

**Table 5: Inclusion in Income Distribution (Country Estimates)**

Country	Optimistic 100-75-25 (M €)	Realistic 75-50-25 (M €)	Pessimistic 50-25-10 (M €)
EU28/27	147,492.2	113,745.3	61,557.3

<b>Country</b>	<b>Optimistic 100-75-25 (M €)</b>	<b>Realistic 75-50-25 (M €)</b>	<b>Pessimistic 50-25-10 (M €)</b>
<b>25 Countries Aggregate<sup>13</sup></b>	122,406.2	94,287.8	50,903.3
<b>Belgique/België</b>	464.5	420.0	277.0
<b>Bulgarija</b>	932.6	715.3	413.1
<b>Česká republika</b>	141.7	115.0	55.6
<b>Danmark</b>	2,338.2	1,810.7	934.1
<b>Deutschland</b>	41,831.1	31,950.9	17,366.6
<b>Elláda</b>	867.5	623.1	356.5
<b>España</b>	13,014.8	9,639.7	5,271.0
<b>France</b>	10,809.0	8,339.3	4,316.7
<b>Italia</b>	13,629.9	10,391.9	5,789.5
<b>Kýpros</b>	200.4	150.6	84.4
<b>Latvija</b>	362.6	271.7	154.7
<b>Lietuva</b>	208.2	162.4	90.1
<b>Luxembourg</b>	274.0	204.9	121.2
<b>Magyarország</b>	1,150.6	909.9	488.8
<b>Malta</b>	64.4	48.5	29.0
<b>Nederland</b>	4,600.8	3,396.4	1,864.4
<b>Österreich</b>	2,691.9	2,008.5	1,187.5

<sup>13</sup> As previously noted, Croatia is not included as it was not part of the EU when the EHSIS survey was completed. Additionally, data from Estonia and Ireland was not available and is not separately reported here.



Country	Optimistic	Realistic	Pessimistic
	100-75-25	75-50-25	50-25-10
	(M €)	(M €)	(M €)
Polska	3,556.0	2,720.4	1,503.9
Portugal <sup>14</sup>	-630.0	-464.7	-212.6
România	2,274.7	1,756.2	968.2
Slovenija	335.7	260.5	137.8
Slovensko	769.7	568.7	320.6
Suomi/Finland	2,584.3	1,934.7	1,102.7
Sverige	1,823.2	1,383.5	830.7
United Kingdom	18,110.3	14,969.5	7,451.9

#### 4.2.1.3 Inclusion in Education

The third way in which the available Eurostat data supports estimating the macroeconomic impact of increased inclusion for people with disabilities is by examining the differences in educational attainment and using the well-documented relationship between educational attainment and income to analyze the potential increase in overall income from greater education. Generally, those with disabilities are not able to complete education and reach the same levels of education as those without. This is an area where the ICT-focus of Prosperity4All could have a significant impact as more and more post-secondary institutions increase their availability of on-line and remote learning. The gap being analyzed in this case is in educational achievement. By closing the gap for educational attainment between the general population and those with disabilities and by assuming average wages based on education level, the overall impact can be estimated.

Once again, optimistic, realistic, and pessimistic assumptions are made in the ability to close that gap. Additionally, since several levels of educational attainment are considered, individuals with disabilities are considered to be moving one step up the ladder – going to the next highest educational attainment level so

<sup>14</sup> Detail for Portugal is provided separately below, but some explanation is required. Nearly half of people in Portugal with moderate (LD\_2-3) or severe (LD\_GE4) disabilities are in the highest income quintile. Part of this is the result of an estimation for unreported data, but it is also likely the result of low employment creating greater disability claims and payments.

that the distribution by educational attainment ends up the same for those with disabilities as the general population.

Eurostat reports on education attainment using the following categories:

- 0 Less than primary
- 1 Primary
- 2 Lower secondary
- 3 Upper secondary
- 4 Post-secondary, non-tertiary
- 5 Short cycle tertiary
- 6 Bachelor's or equivalent
- 7 Master's
- 8 Doctorate

Data on educational attainment for those with disabilities (limitations LD\_1, LD\_2-3, LD\_GE4) and for the overall population and for wages by education level are reported in the following categories:

ED0\_2

ED3\_4

ED5\_6 (8) – 5-6 are reported in the EHSIS survey and 5-8 for the general population

**Table 6: Inclusion in Educational Attainment (EU wide)**

EU 28		Share				Gap		
Ed Level	Share	Salary (€)	LD_1	LD_2-3	LD_GE4	LD_1	LD_2-3	LD_GE4
ED0_2	27.6%	13,742	38.6%	46.6%	52.7%	-10.9%	-19.0%	-25.1%
ED3_4	46.1%	16,708	42.7%	38.8%	34.5%	3.4%	7.3%	11.6%
ED5-6(8)	25.1%	24,475	17.8%	13.3%	11.9%	7.3%	11.8%	13.2%

Ed Level	Current Number of People (000)				Number of People Shift In/Out (000)		
	Salary (€)	LD_1	LD_2-3	LD_GE4	LD_1	LD_2-3	LD_GE4
ED0_2	13,742	9,999.2	9,803.2	13,738.6	-2,839.2	-3,999.1	-6,542.2
ED3_4	16,708	11,075.5	8,157.7	9,001.7	891.3	1,543.0	3,025.9

	Current Number of People (000)			Number of People Shift In/Out (000)			
ED5-6(8)	24,475	4,610.6	2,791.0	3,093.3	1,901.4	2,487.9	3,451.8

Assumptions		LD_1 (M €)	LD_2-3 (M €)	LD_GE4 (M €)	Total (M €)
Optimistic	100-75-25	18,305.6	23,459.1	11,505.8	53,270.5
Realistic	75-50-25	13,729.2	15,639.4	11,505.8	40,874.4
Pessimistic	50-25-10	9,152.8	7,819.7	4,602.3	21,574.8

The three tables above show the educational attainment gaps, the shifts in educational attainment that would have to occur to get the distribution the same for those with a disability and the general public and the total economic impact on annual wages under the various assumptions of closing the gaps.

The important thing to note about the second table is the shifts occur up the ladder. So, while 2.8 million more people with a single limitation or a mild disability (LD\_1) need to move to level 3 or 4, 1.9 million people currently at level 3 or 4 need to move to level 5 or 6. The number of people shifting among all levels is not equal as the reported numbers for each category don't report level 7 or 8 (post-secondary) for those with a disability, but they are in the totals. The reported numbers for people that need to shift makes it look like nearly 2 million people need to jump from level 0 to level 6, but that is not the case. The estimates in the third table make the shifts up the ladder, and consider the net change in total income, including income lost from people at lower education level who move up the ladder. And, all moves are from one level to the level immediately above it.

The overall estimates in the third table show that if even a portion of the necessary shift in educational attainment is made so that the distribution by education for people with disabilities resembles the average distribution, the annual increase in incomes associated by the increase in education would range from 21.5 to over 53 million Euro.

The table below shows the country by country estimates for the 24 countries for which data is available. It also shows the aggregate of those 24 countries which is lower than the EU-wide estimated impact but is for fewer countries. This difference is partly due to the variability in average income for educational attainment across countries, but the results are still similar. As with employment and income distribution, increased inclusion for people with disabilities across the countries of the EU could result in higher educational attainment creating annual income increases in the hundreds of millions to billions of Euro.

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**Table 7: Inclusion in Educational Attainment (Country Estimates)**

Country	Optimistic 100-75-25 (M €)	Realistic 75-50-25 (M €)	Pessimistic 50-25-10 (M €)
<b>EU28</b>	53,270.5	40,874.4	21,574.8
<b>24 Countries Aggregate<sup>15</sup></b>	38,239.1	29,618.7	15,376.6
Belgique/België	1,256.1	961.7	529.5
Bulgarija	420.1	325.4	176.4
Danmark	559.5	442.9	225.6
Deutschland	1,926.5	1,546.2	655.6
Elláda	1,448.8	1,083.0	602.0
España	7,339.7	5,552.9	2,902.8
France	7,954.6	6,038.8	3,248.9
Italia	5,973.2	4,799.8	2,438.0
Kýpros	1,395.8	1,086.0	596.5
Latvija	165.6	126.2	68.8
Lietuva	228.6	174.5	92.1
Luxembourg	192.8	143.0	81.1
Magyarország	569.0	455.0	233.5
Malta	1.3	1.2	0.6
Nederland	1,409.7	1,035.9	578.4
Österreich	703.8	549.4	322.3
Polska	3,855.1	2,960.7	1,615.1
Portugal	12.4	14.5	6.8

<sup>15</sup>Croatia, Ireland, Estonia, and the Czech Republic did not have sufficient data for estimates and is not separately reported here. Ecosystem infrastructure for smart and personalised inclusion and PROSPERITY for ALL stakeholders

Country	Optimistic	Realistic	Pessimistic
	100-75-25	75-50-25	50-25-10
	(M €)	(M €)	(M €)
România	592.0	471.1	241.0
Slovenija	234.9	178.8	101.3
Slovensko	188.2	140.2	79.7
Suomi/Finland	982.0	734.5	421.7
Sverige	578.4	429.9	249.0
United Kingdom	251.1	367.1	-90.2

#### 4.2.1.4 Combined Annual Value of Increased Inclusion

The three different estimates of the potential impact of increased economic inclusion for people with disabilities across the EU are repeated below.

**Table 8: Impact from Inclusion in Employment**

Assumptions		LD_1 (M €)	LD_2-3 (M €)	LD_GE4 (M €)	Total (M €)
Optimistic	100-75-25	140,225	26,637	63,017	229,879
	75-50-25	105,169	17,758	63,017	185,944
Pessimistic	50-25-10	70,113	8,879	25,207	104,198

**Table 9: Impact from Inclusion in Income**

Assumptions		LD_1 (M €)	LD_2-3 (M €)	LD_GE4 (M €)	Total (M €)
Optimistic	100-75-25	62,066	54,691	30,735	147,492
	75-50-25	46,549	36,461	30,735	113,745
Pessimistic	50-25-10	31,033	18,230	12,294	61,557

**Table 10: Impact from Inclusion in Education**

Assumptions		LD_1 (M €)	LD_2-3 (M €)	LD_GE4 (M €)	Total (M €)
Optimistic	100-75-25	18,305.6	23,459.1	11,505.8	53,270.5
Realistic	75-50-25	13,729.2	15,639.4	11,505.8	40,874.4
Pessimistic	50-25-10	9,152.8	7,819.7	4,602.3	21,574.8

Although it would be convenient to claim that total potential annual impact is the aggregation of these various estimates, it would not be accurate. Increasing educational attainment increases income which in turn would change the distribution of income for individuals with disabilities so that more are in the higher income quintiles. Increased employment similarly leads to increased income and higher income quintile distributions. Education can be one of the means by which employment opportunities can be enhanced and employment levels increased. These estimates are not independent of each other but are interrelated. And, while they have some overlap, they also do not overlap completely. Each is, in effect, a different lens through which one can look to answer the question: What are the potential macroeconomic impacts across the EU of increased economic inclusion of people with disabilities?

The answer (of course) is “it depends...” The numbers above represent an attempt to estimate the impacts using the available data and various scenarios to show what is possible each and every year. The only underlying assumption is that people with disabilities can and should be more widely included in European economic life. The only difference in the numbers is from the extent to which that inclusion can be successfully implemented (the optimistic, realistic, and pessimistic scenarios). These estimates only consider the GDP increases from increased wages. Assuming a level of inclusion appropriate to generate these results would also mean that social service costs would be reduced. Getting more people with disabilities economically engaged and earning wages means that social service and welfare costs would eventually be reduced<sup>16</sup>.

What these estimates show is that increased economic inclusion for people with disabilities can have tremendous impacts. Even only marginal success in closing the existing gaps in employment, income distribution or education would create tens of billions of Euro of impact in the form of additional wages and additional GDP every year. It can extend to hundreds of billions when greater inclusion is achieved.

<sup>16</sup> A tremendous caveat with this is that in order to accomplish these levels of inclusion, those costs would first be increased. The long term “steady state” would see a reduction in those costs, but that cost savings should not be the motivating factor and will develop over a long time frame. One of the real challenges with getting individuals with disabilities employed and earning a wage is not to disincentivize them by immediately cutting support payments when they start working. A transition period during which income stability can be established is necessary.

These benefits have been developed based on the growth of universal inclusion – addressing limitations in any and all of the ten life areas identified in the EHSIS survey analysis. We next consider how to weight these estimates to develop estimates specific to the potential impact of Prosperity4All. For simplicity and tractability, only the pessimistic estimates will be considered. That scenario assumes:

- 50% of the gap can be closed for people with one limitation (LD\_1, mild disability)
- 25% of the gap can be closed for people with two or three limitations (LD\_2-3, moderate disability)
- 10% of the gap can be closed for people with four or more (out of 10) limitations (LD\_GE4, severe disability)

These assumptions equally imply that the share of people (50% of all people below the gap completely bridge the gap) or the share of impact (100% of the people below the gap average 50% of what is needed to bridge that gap) or an equivalent combination occurs. In using the pessimistic assumptions in estimating Prosperity4all impact, we are already assuming that Prosperity4All will not impact 50% of people with one limitation, 75% of people with two or three limitations, and 90% of people with four or more limitations.

#### 4.2.1.5 Potential Impacts of P4All on the ecosystem enabled by the infrastructure

The table below summarizes the estimates developed from the EHSIS for the number of people across the EU (27 countries) that face each of the barriers across the ten life areas. The share of total limitations faced among those who report at least one limitation is also given. The estimates developed from the survey suggest that 42.2 million people face one or more limitations with 16.6 million (39.3%) with one; 11.4 million (27.0%) with two or three; and 14.2 million (33.7%) with four or more.

**Table 11: Limitations Descriptions and Estimates (EU wide)**

<b>Limitation Type</b>	<b>Number People</b>	<b>Share</b>	<b>Description</b>
Barriers to accessing buildings	12,150,200	7.3%	Accessibility to buildings that everyone uses including workplaces, schools, offices, shops and other people’s homes.

Limitation Type	Number People	Share	Description
Barriers of perceived discrimination	11,359,900	6.8%	Discrimination occurs when people are treated unfairly because they are seen as being different from others. Do you feel you are treated unfairly by other people because of any of the reasons on this card? (01) Age (02) Sex or Gender (03) Ethnicity (04) A longstanding health condition, illness or disease (05) Longstanding difficulties with basic activities (06) Religion (07) Sexual Orientation (08) None of these
Barriers to education and training	12,782,900	7.7%	Formal education or training opportunities that may be available to you. This addresses formal education at a school, college or university or formal training related to a job, trade or profession.
Barriers to employment	21,632,700	13.0%	The reasons why people may not be able to do the kind of paid work that they want to. By kind of paid work we mean the type of work people can do, where or when they can work or how long they can work for.
Barriers to using the Internet	2,310,300	1.4%	Your use of the Internet.
Barriers to leisure	24,731,100	14.9%	Hobbies or interests that involve spending time with other people. For example, belonging to a club or association, or taking part in sporting and fitness activities.
Barriers to mobility	19,068,200	11.5%	Your ability to leave your home whenever you want to.
Barriers to paying for the essential things in life	9,091,900	5.5%	How easy or difficult you are finding it to pay for the essential things in life such as food, clothing, medicine, housing and transport.



Limitation Type	Number People	Share	Description
Barriers to social contact	900,800	0.5%	People you feel close to. you could count on them if you had a serious personal problem. speak with any of them, either in person or by telephone, as often as you wanted
Barriers to transport	9,830,500	5.9%	Your ability to use motorised transport whenever you want to.
Grand Total	166,086,900		
<b>Potential Prosperity4All to Impact Barrier</b>			
	Negligible; not at all (0%)		
	Minimal; impact only in specific situations (10%)		
	Moderate; ICT solutions can reduce some barriers but not all (25%)		
	Significant; ICT focus should directly address most barriers (75%)		

The shading indicates the degree to which Prosperity4All solutions could help to reduce those specific barriers. While barriers to access to the internet would be significantly reduced, reducing of perceived discrimination are not likely to see a direct impact. The key indicates the assumption for the share of people facing each barrier that could see a reduction in that barrier from the implementation of the Prosperity4All infrastructure which will enable the ecosystem of reduced barriers.

Weighed by these factors, Prosperity4All could reduce 18,049,015 of the 166,086,900 barriers faced by individuals across the EU. This is 10.9% of the total.

Returning to the original impact estimates and then further weighting by the potential of Prosperity4All to impact 10.9% of the barriers results in the table below.

**Table 12: Potential Prosperity4All Economic Impacts (EU wide)**

Original Estimate	Pessimistic				Optimistic	Realistic
	LD_1	LD_2-3	LD_GE4	Total	Total	Total
	(M €)	(M €)	(M €)	(M €)	(M €)	(M €)
<b>Employment Impact</b>	70,113	8,879	25,207	104,198	229,879	185,944
<b>Income Distribution Impact</b>	31,033	18,230	12,294	61,557	147,492	113,745
<b>Education Impact</b>	9,153	7,820	4,602	21,575	53,271	40,874
<b>P4All Estimate</b>						
<b>Employment Impact</b>	7,642	968	2,748	11,358	25,057	20,268
<b>Income Distribution Impact</b>	3,383	1,987	1,340	6,710	16,077	12,398
<b>Education Impact</b>	998	852	502	2,352	5,806	4,455

Given the already reduced estimates of varying potential impact by number of limitations that need to be overcome, this further reduction helps to create an estimate of the potential annual macroeconomic impact from the implementation of the Prosperity4All infrastructure with the subsequent development of the robust ecosystem that it is designed to enable. That impact ranges from around 2 to 25 billion Euro annually. The same 10.9% adjustment factor could also be applied to all of the individual country estimates (given above in this report) to document the potential of the emergence of the full inclusive ecosystem enabled by the Prosperity4All infrastructure.

## 4.2.2 Market (Supply/Demand) Impacts

### 4.2.2.1 Increased General Retail/Services Sales

General retail goods and services that could be positively impacted by increased accessibility is as follows<sup>17</sup>:

<sup>17</sup> All data from 2013, Structural Business Statistics, most of the 2013 data is reported as provisional. In a few cases where 2013 data was not yet available, 2012 values have been used.

**Table 13: Potential Impact Areas on Increased General Retail/Services Sales (EU wide)**

	EU28 (M €)
<b>Accommodation and food service activities</b>	499,240
<b>Information and communication</b>	1,171,737
<b>Professional, scientific and technical activities</b>	1,262,572
<b>Wholesale and retail trade; repair of motor vehicles and motorcycles</b>	9,726,799
	12,660,348

Approximately 8.4% of the population of the EU has at least one limitation. Those limitations do not all relate to the ability to consume goods and services, and in some cases, the limitation results in additional expense and consumption. However, (admittedly mostly preliminary and anecdotal) results show that the removal of “blue laws”, i.e., allowing retail and other consumer establishments to do business on Sundays<sup>18</sup> can result in increased sales and not just a redistribution of existing sales. eRetail has had some negative impact on bricks and mortar retailers, but it has also increased the total amount of retail activity. Additional access may redistribute some sales, but it can also increase the “size of the pie”. Since the focus of this estimation is on increasing access, it does not stretch credibility too much to suggest that increased accessibility for people with disabilities could result in increased sales.

But, that is not to say that this impact would be very large – the only argument required is that some positive impact is possible. Given that 8.4% of the population has a limitation and keeping with the conservative estimate that 50% of that population could be impacted in any way by increased accessibility and given that 10.9% of all limitations could be addressed by the ecosystem enabled by the implementation of the Prosperity4All infrastructure, retail sales could see a growth of about one-half of one percentage point ( $0.459\% = 0.084 \times 0.50 \times 0.109$ ) per year. For the current estimate (above), this would result in an increase in EU GDP from the additional sales of goods and services of just over 58 billion Euro.

The table below shows by EU member state the total sales for the four industry groups listed above and the potential impact of the 0.459% increase. Estimates vary directly with market size as that forms the basis for the increase. The 27 country total and EU28 estimates are very much in line with each other.

<sup>18</sup> <http://www.newyorker.com/business/currency/americas-last-ban-sunday-shopping>, [http://www.jstor.org/stable/40229910?seq=1#page\\_scan\\_tab\\_contents](http://www.jstor.org/stable/40229910?seq=1#page_scan_tab_contents) others

Table 14: Impact on Increased General Retail/Services Sales (Country Estimates)

Country	Total Sales (M €)	Prosperity4All Potential Impact (M €)
EU28	12,660,348	58,111
27 Countries Aggregate <sup>19</sup>	12,752,026	58,532
Belgique/België	511,575	2,348
Bulgarija	58,616	269
Česká republika	167,025	767
Danmark	214,417	984
Deutschland	2,376,430	10,908
Éire/Ireland	229,184	1,052
Elláda	136,199	625
España	857,410	3,936
France	1,862,166	8,547
Hrvatska	38,248	176
Italia	1,232,767	5,658
Kýpros	15,069	69
Latvija	28,600	131
Lietuva	33,592	154
Luxembourg	115,880	532
Magyarország	102,705	471
Malta	9,576	44
Nederland	739,060	3,392

<sup>19</sup> Estonia does not have sufficient data for estimates and is not separately reported here.

Country	Total Sales (M €)	Prosperity4All Potential Impact (M €)
Österreich	308,794	1,417
Polska	398,263	1,828
Portugal	150,693	692
România	117,073	537
Slovenija	37,835	174
Slovensko	60,639	278
Suomi/Finland	152,031	698
Sverige	380,394	1,746
United Kingdom	2,417,785	11,098

#### 4.2.2.2 Increased Sales of Accessible Products and Services

The second and more direct impact that could result from the Prosperity4All infrastructure enabling an inclusive infrastructure is increases in the sale of ICT and ICT-related goods and services. This impact could be specific to accessible technologies, but as with general retail above, increased accessibility should also result in increased sales.

The specific industries included in this estimate are listed below. They are listed by NACE (r2) code which is what is reported by Eurostat. The J and C26 are higher level codes for which the more detailed industries included within that code are listed. Data is reported here aggregated to higher level codes. The industry codes for which data is reported are shaded below. These industries are either direct ICT industries or are industries with the potential for a significant ICT component.

**Table 15: ICT and Related Industries Codes and Descriptions (NACEr2)**

nace_r2	Description
J	Information and communication
J5811	Book publishing

<b>J5812</b>	Publishing of directories and mailing lists
<b>J5813</b>	Publishing of newspapers
<b>J5814</b>	Publishing of journals and periodicals
<b>J5819</b>	Other publishing activities
<b>J5821</b>	Publishing of computer games
<b>J5829</b>	Other software publishing
<b>J5911</b>	Motion picture, video and television programme production activities
<b>J5912</b>	Motion picture, video and television programme post-production activities
<b>J5913</b>	Motion picture, video and television programme distribution activities
<b>J5914</b>	Motion picture projection activities
<b>J5920</b>	Sound recording and music publishing activities
<b>J6010</b>	Radio broadcasting
<b>J6020</b>	Television programming and broadcasting activities
<b>J6110</b>	Wired telecommunications activities
<b>J6120</b>	Wireless telecommunications activities
<b>J6130</b>	Satellite telecommunications activities
<b>J6190</b>	Other telecommunications activities
<b>J6201</b>	Computer programming activities
<b>J6202</b>	Computer consultancy activities
<b>J6203</b>	Computer facilities management activities
<b>J6209</b>	Other information technology and computer service activities
<b>J6311</b>	Data processing, hosting and related activities
<b>J6312</b>	Web portals
<b>J6391</b>	News agency activities
<b>J6399</b>	Other information service activities n.e.c.

<b>C182</b>	Reproduction of recorded media
<b>C26</b>	Manufacture of computer, electronic and optical products
<b>C261</b>	Manufacture of electronic components and boards
<b>C262</b>	Manufacture of computers and peripheral equipment
<b>C263</b>	Manufacture of communication equipment
<b>C264</b>	Manufacture of consumer electronics
<b>C265</b>	Manufacture of instruments and appliances for measuring, testing and navigation; watches and clocks
<b>C266</b>	Manufacture of irradiation, electromedical and electrotherapeutic equipment
<b>C267</b>	Manufacture of optical instruments and photographic equipment
<b>C268</b>	Manufacture of magnetic and optical media
<b>C275</b>	Manufacture of domestic appliances
<b>C322</b>	Manufacture of musical instruments
<b>C323</b>	Manufacture of sports goods
<b>C324</b>	Manufacture of games and toys
<b>C325</b>	Manufacture of medical and dental instruments and supplies

The table below summarizes the total sales (turnover) for the EU28 for these industries<sup>20</sup>. Across the EU, the ICT industry generates just over 1.5 trillion Euro in annual sales. Nearly three-quarters is specifically in the Information and Communications Industry, and almost three-quarters of the rest is in the Manufacture of Computer, Electronic, and Optical Products. As these are “higher level” categories, they should be expected to be larger. But, the table provides a rough sense of the distribution of sales across industry.

<sup>20</sup> As before, the data are from 2013 and are mostly provisional numbers. When the 2013 value was not available, the 2012 value has been used in its place. EU28 estimates for C324 (Manufacture of games and toys) is not reported at that level in either 2013 or 2012 and so the value shown is the sum of those countries for which this data has been provided – many countries also do not have a value for this industry, so this is likely under-reported here.

**Table 16: Impact on ICT and Related Industries Sales (EU wide)**

nace_r2	Total Sales (M €)	Share (%)
J	1,171,737	74.3%
C182	3,589	0.2%
C26	280,000	17.8%
C275	43,703	2.8%
C322	1,406	0.1%
C323	6,357	0.4%
C324	6,414	0.4%
C325	63,384	4.0%
<b>Total</b>	<b>1,576,591</b>	

The next challenge is to determine a method for estimating the potential impact from the implementation of Prosperity4All on sales for firms in the ICT and related industries. In estimating the potential general retail sales impact, the assumption was 50% of the 8.4% of the population that has at least one limitation could conceivably benefit from increased inclusion. That was then further weighted by the 10.9% of limitations that Prosperity4All might be able to address. Given that the impact in this case is specifically for ICT and ICT-related firms and that is the focus of Prosperity4All, the potential impact should be 4.2% (50% of 8.4%). The assumption that share of sales is correlated with share of the population with a disability is not an unreasonable one given that while the specifics of some of what is purchased may be different because a disability or other limitation, the amount of goods and services purchased is likely to be independent of disability status. This is further bolstered by the finding that among those reporting a limitation in one or more of the ten life areas, only 5.5% reported a barrier in “paying for the essential things in life”. Those in that 5.5% could easily be included among the 50% who are already assumed to be unable to benefit from increased inclusion. That 50% reduction already takes into consideration that many people with a disability will not be easily impacted and so are excluded from the estimation as they will not generate additional demand. However, little of current sales in ICT and related industries directly relates to accessibility technologies. While specific information is not available and the 8.4% is intended to provide some compensation, that compensation is on the demand side. An additional adjustment should be made to



recognize that Prosperity4All is intentionally designed to improve access to information on accessibility and inclusion for the ICT industry and create for individuals with disabilities the infrastructure to enable a more inclusive ecosystem, which will involve new accessible and accessibility-enabled ICTs but that is only a small portion of the overall industry. The addition of a further 50% reduction in potential impact should provide some compensation.

Altogether the assumptions about share of the market impacted from the demand side (50% of 8.4%) and impact on the supply side (a further reduction of 50%) results in an estimated impact on sales for ICT and ICT-related industries of 2.1%. On total EU sales of 1.58 trillion Euro, the estimated annual increase in sales with its corresponding increase in GDP would be just over 33 billion Euro.

The table below shows by EU member state the total sales for the ICT industry groups listed above and the potential impact of the 2.1% increase. Estimates vary directly with market size as that forms the basis for the increase. The 27 country total and EU28 estimates are very much in line with each other.

**Table 17: Impact on ICT and Related Industries Sales (Country Estimates)**

Country	ICT Total Sales (M €)	Prosperity4All Potential Impact (M €)
EU28	1,576,591	33,108
27 Countries Aggregate <sup>21</sup>	1,562,598	32,815
Belgique/België	37,510	788
Bulgarija	4,381	92
Česká republika	25,487	535
Danmark	25,490	535
Deutschland	331,724	6,966
Éire/Ireland	83,669	1,757
Elláda	9,719	204
España	81,005	1,701

<sup>21</sup> Estonia does not have sufficient data for estimates and is not separately reported here.

<b>Country</b>	<b>ICT Total Sales (M €)</b>	<b>Prosperity4All Potential Impact (M €)</b>
<b>France</b>	225,861	4,743
<b>Hrvatska</b>	3,936	83
<b>Italia</b>	143,552	3,015
<b>Kýpros</b>	1,088	23
<b>Latvija</b>	1,795	38
<b>Lietuva</b>	1,995	42
<b>Luxembourg</b>	8,612	181
<b>Magyarország</b>	23,781	499
<b>Malta</b>	833	17
<b>Nederland</b>	67,220	1,412
<b>Österreich</b>	28,090	590
<b>Polska</b>	41,865	879
<b>Portugal</b>	14,407	303
<b>România</b>	11,093	233
<b>Slovenija</b>	4,932	104
<b>Slovensko</b>	11,868	249
<b>Suomi/Finland</b>	42,889	901
<b>Sverige</b>	65,119	1,368
<b>United Kingdom</b>	264,679	5,558